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08 What To Do If You're Hacked

No security is 100% effective, so there's always a chance that your accounts could be broken into by hackers. However, there are steps you can take to make things more difficult for them and, should the worst happen, there are also things you can do to minimise the damage and get back control. David Crookes explains...

18 Wireless Speakers

Thanks to technologies like wi-fi and Bluetooth, it's never been easier to add wireless speakers to your entertainment setup or PC, but which of these technologies should you go with? Each has its own advantages and disadvantages, so it's not always a straightforward choice. That's why we've asked Mark Oakley to provide some much needed advice

28 Raspberry Pi CamJam

The Raspberry Pi, as you no doubt know, has a huge amount of potential for creative projects and hardware hacks. The problem, though, is deciding how to get started. That's by the CamJam organisation has put together a kit that makes getting into this fascinating field much more easy

48 Universal Remote Control Apps

Why have several remote controls when you can have one, and why have any remote controls when you can just use your Android phone? Thanks to dedicated remote control apps, some of which even support infrared, you can control all your gadgets with ease. We've been trying out six apps to see what they're made of

48 Universal Remote Control Apps

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58 The Problem With Read Receipts

Have you ever received an email that you mean to answer, but you put it aside for later? For all the sender knows, you haven't seen it yet, so you can just stall for a while – unless, that is, they've added a read receipt. Then they can tell you've seen it, which just makes you look rude. Sarah Dobbs wonders if there's anything you can do about it

62 The Amiga Story: Part 1

Like many of you, we were huge fans of the Amiga, back in the day of the Batman pack and Deluxe Paint. But what happened to it, and what legacy has it left behind? Well, to give us a more detailed account of this fascinating story, our resident Amiga expert, Sven Harvey, is telling the tale in this special two-part series



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What To Do If Your Account Is Hacked

(And How You Can Protect Yourself)

As more and more people fall victim to online hackers, David Crookes look at the defensive steps you need to take

Barely a week goes by these days without some sort of hacking story emerging in the news. Recently, there have been major security breaches at some of the best-known online companies across the world – from Sony, to Dropbox, to Ashley Madison – and all of them have led to disruption on some scale. Whether hacked accounts simply force users to subsequently change their passwords, or cause a major leak of information and prompt a major overhaul of the back-end system of the affected service, hacking leads to inconvenience and at worse loss of money and privacy.

The latest scandal has been the hacking of the system belonging to broadband and phone provider TalkTalk. It has been breached three

times now, with customer data stolen by what would appear to be a Russian jihadist cyberterrorist group. As many as four million people have been affected by the issue and TalkTalk's shares plummeted by 9% following the news. After all, when customers find that their name, address, date-of-birth, email address, telephone number, TalkTalk account information and credit card and bank details have been accessed, it is sure to have an impact on the business.

According to Sophos Labs, the problem of hacked accounts is vast. It says an average of 30,000 new websites are used to distribute malicious code each and every day and, while it used to be that people thought only dodgy areas of the web (such as gambling or

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Why you need it [How it works](#) [How it protects you](#)

It's easier than you think for someone to steal your password

Any of these common actions could put you at risk of having your password stolen:

- Using the same password on more than one site
- Downloading software from the Internet
- Clicking on links in email messages

2-Step Verification can help keep bad guys out, even if they have your password.

▲ *Google and many other online services offer two-step verification so introduce a random element into the login procedure*

pornography sites) would infect people's computers, and therefore compromise the internet accounts they hold, that is not the case any more. Cyber criminals are infiltrating the sites of small businesses and seeking to smash down the doors of the larger concerns where the spoils are plenty. In America alone, half of all adults had been hacked in the year leading up to May 2014, with some 40 million credit card numbers and 70 million addresses compromised.

“ The more devices connected to the internet, the greater the chance of accounts becoming compromised ”

It is not set to get any better any time soon. The more devices there are connected to the internet, the greater the chance accounts will be compromised. People still gamble by logging on to services from public wi-fi zones and companies, despite their promises, still leave holes for criminals to exploit; people still write down passwords, use the same one multiple times, or both. We must avoid paranoia, but we need to be aware that there are people out there hellbent on getting our details and yet we can be woefully unprepared.

The problem is that our accounts are so valuable. Bank accounts are worth between 3% and 6% of the balance on the black market, and are bought by financial thieves who will attempt to withdraw cash or launder money. Gambling accounts sell for a couple of pounds each, but contain usernames, payment cards, security questions and bank account details. Twitter accounts sell for 0.02p, and tend to be used by spammers to post rogue adverts using your account. Facebook accounts are worth a bit more because spam under your name on the site can trick people into trusting the link. Meanwhile PayPal accounts tend to sell for £50 and eBay accounts for £8.

Dark web forums are awash with people who want to snap up compromised accounts. It is just a short step towards someone being able to impersonate and defraud a host of victims – and as we have seen with TalkTalk, it is already happening.

Experts are warning that customers with a compromised account are likely to be plagued by conmen for years to come, and yet the company hasn't been making it easy to leave the service if their contract isn't up. Reports say customers have been told they need to pay £245 to do that, which has caused an outcry among those who believe they should be compensated rather than penalised.

After all, the potential for damage is high: one elderly couple was reported to have lost £8,000 when someone called them pretending to be from TalkTalk offering to credit them with £200 by way of apology. They were tricked into handing over their bank details, after which the criminals were able to drain the compromised account of cash.

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';--have i been pwned?

Check if you have an account that has been compromised in a data breach

Important notice regarding the Ashley Madison data: only those who have subscribed for notifications and verified their email address will be able to discover if they were in the breach due to the sensitivity of the data. You can read more about the rationale of this approach [here](#).

pwned?

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Protect Yourself

Social Engineering, or fooling people into parting with their information, is the most common way for hackers to gain access to accounts. In truth, the mass hacking cases that we've seen with TalkTalk and Sony – and all of the other companies that have fallen foul – are actually less of a problem. It has been written about time and time again, but malware and phishing remain the biggest issues in the war against hacking.

“With a secondary email address, getting back up and running again is far quicker”

By being very vigilant about the software that you download from the internet and install on your devices and computers, you are forming the first line of defence. You don't want software searching your PC for saved passwords or a utility logging each and every keypress you make, so be sure to watch out for software that attempts to trick you into downloading another piece of software during the installation process – something that, unfortunately, is becoming far too common – and only download from trusted sources.

At the same time, be wary of phishing. Each day, we at *Micro Mart* towers receive numerous emails that tell us our bank accounts have been compromised or that we need to change our passwords to the services that we use most often. They are nearly always sent by tricksters who are hoping that we

Check For Hacked Accounts

One way for you to see if any of your accounts have been compromised is to check your email address at **haveibeenpwned.com**. It will be cross-referenced against 223 million potentially compromised accounts drawn from 56 hacked websites. Best of all, it is safe and easy to use.

The site covers some of the largest breaches in history. It will let you check your address against the 152,445,165 Adobe accounts that were hacked in 2013, see if you were one of the 4,609,6145 Snapchat accounts compromised in 2014 and even go as far back as 2011 when 37,103 accounts from Sony were breached. You can also set up an alert, which gives you instant notified of future breaches.

As you may expect, this website became rather popular after 30,811,934 Ashley Madison accounts were hacks, but some visitors would have been disappointed to see that they had to subscribe and be verified to discover the affected accounts. “The discovery of one's spouse in the data could have serious consequences,” wrote site owner Troy Hunt.

become worried enough to click a link and enter our details. With those in hand, the hacker basically has everything they need to start unlocking the account in question and, if you use the same details elsewhere on the web, other services too. It's a frightening prospect. What's more, it exploits the same principle as the hackers who target small websites – that may not have adequate security – in the hope of gleaning account information that can be checked against other websites.

Which brings us to the issue of passwords. It is important to use different, hard-to-crack, passwords for each of the services that you use online. Use a website such as *How Secure Is My Password*

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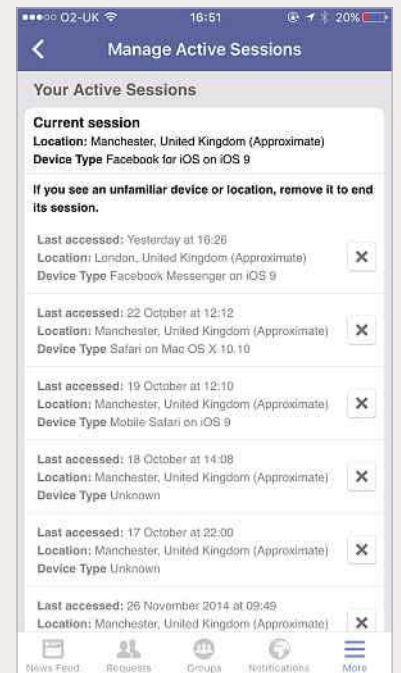
Are You Under Government Surveillance?

Your account is not only under threat from criminal hackers, government agencies are also known to try and access the personal details of people signed up to various online services. It's not a new problem by any means: in 2011, *The Guardian* reported that governments across the world were infecting targeted computers with spyware so that they could covertly monitor Skype conversations and see the details of accounts.

Acutely aware that this kind of thing could put people off divulging personal information on websites, particularly social media, some websites have been hitting back. Facebook is now warning users if it feels that a nation-state or a state-sponsored actor is compromising their account. The details were revealed in a blog post written by Facebook's Chief Security Officer Alex Stamos.

He wrote: "While we have always taken steps to secure accounts that we believe to have been compromised, we decided to show this additional warning if we have a strong suspicion that an attack could be government-sponsored. We do this because these types of attacks tend to be more advanced and dangerous than others, and we strongly encourage affected people to take the actions necessary to secure all of their online accounts."

An example of the notification Facebook will be using was also shown. It advises those whose online accounts are being compromised to turn on Login Approvals which means a security code will be needed in order to access an account. Facebook will not explain how certain attacks are attributed to suspected attackers though. This, it says, is "to protect the integrity of our methods and processes."



(howsecureismypassword.net) to check how secure yours is and, as an added security tip, don't type in the actual password that you are going to be using in this site: create a test password that uses the same principles of capital letters, lower-case letters, punctuation, numbers and so on.

Yet what should you do if your account does become compromised and how would you actually know? In a lot of cases, people do not realise that they have a problem until it's too late. They often check their bank account to find sums missing or they look at their credit card statements to see purchases they can not remember making added to them. They try to log in to social media, email, eBay, PayPal and Amazon accounts only to find they are locked out.

It causes stress and worry and so it should. If one account has been hacked, who is to say that other accounts have not been hacked as well. Again, as we've seen, fraudsters and criminals know that people tend to use the same information over and over and they won't stop with one website. This leads to site after site becoming out-of-bounds to the user and it's scary stuff.

Email Fixes

If this happens, you will need to go through the individual services you are signed up to, one by one, changing the passwords to them all. But sometimes is not always as easy as that. A hacker may cause untold damage to an account before you get a chance to sort it out, grabbing your details, deleting crucial files and so on.

With email, for example, Yahoo! says hackers who gain access to an account may use the opportunity to make changes to it and send spam or other messages. They may infiltrate your account so that you see multiple failed delivery messages or they may redirect emails elsewhere so that you never see them. Worse, they may change the password so that you can't even get into your own account. It is not uncommon for hackers to do this either.

Thankfully many email providers do allow you to reset your account, but in a lot of cases you will need to have prepared the ground beforehand. Gmail uses the secondary email address, mobile phone or secret questions to help you regain control (go to www.google.com/accounts/recovery). This entails you having inputted these details in the first place. At the very least, you

need to have a secondary email set up with your account and this should be something you seek to do right away. With a secondary email address, getting back up and running with a compromised account made far quicker and easier and you can then take the opportunity not only to check all of your settings to ensure that they are all in order – by looking at the signature, the auto-reply, the name on the email account and so on – but you can also reassess the way you access the account in the future.

It is also worth taking advantage of two-factor authentication. This provides an extra layer of security when you're logging in by asking for a username, a password and a unique code that will be sent to your mobile phone either by voice or text. It may sound like a pain but there are ways to minimise the fuss. Two-factor

▲ If your account has been compromised and you've been locked out, there are set procedures with many services that allow you to regain control

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Turn on Login Approvals

verification can be turned off on certain machines such as the one you use at home. This means you will be able to log in as normal on the computers you use most often while locking out others trying to gain access on their own.

If your account is hacked, then you need only go to the relevant webpage of your email provider and let the service know. The Outlook email service allows users to go to account.live.com/password/reset, for instance, and select "I think someone else is using my Microsoft account". Others have a similar kind of set up.

What happens during this process, though? In the case of Outlook, you will be asked to select the reason for your suspicion before inputting your email address or phone number and going through the security questions that enable the provider to verify you are who you say you are. When you do this, your account settings are cleared, which means email forwarding and auto-replies are stopped. You will have to restore your emails and contact again too which, in the case of Outlook.com, you will find at the bottom of the Deleted folder in an option marked "recover deleted messages".

“ Kaspersky Lab says people need to check payment services for unauthorised activity ”

One of the problems comes if you cannot actually remember the answer to your secret question or if you find that a hacker has changed it. Depending on the company, you may then have to write to the email service provider with proof or try again— sometimes you can indicate that you were unable to regain access and go down a different route. During the period where your email account is suspended, you need to use another email address to inform all your contacts that you are having problems and tell them to ignore any odd messages that they have received.

Unsocial Hacking

Securing your email is important because so many other services rely on it. When you reset passwords, you are usually asked to verify you want to go ahead via an emailed link so, without a working email account, you can end up in a vicious circle. Let's say that a hacker managed to hack your eBay and email accounts. You would go to change the eBay password, the verification would be sent to your email and the hacker

Where Are You?

Facebook keeps an eye on your location when you use it on your iPhone or Android device. These details are for your own information and while you may not want Facebook to log your whereabouts, it can be an effective tip-off that someone is hacking your account. If a strange location shows in your feed, then you need to immediately change your password. You should also go to the Security Settings in your app and look for Active Sessions. If you see anything unusual there too, you may have a problem. Finally, you can also check the recognised devices associated with your account and remove any you don't recall.

would be able to see what you're doing and intervene. In all hacking cases where any non-email account is compromised, it is always a good idea to immediately change your email password too even if the email account actually seems unaffected.

That's because it is not always apparent that someone is accessing your accounts. You may spot rogue posts coming from your Facebook or Twitter account or your friends, family or colleagues may be getting messages from you that you didn't send. You may also find that your friends and following lists look suspicious: on Twitter, it could be that you're suddenly following a lot of new and unknown people. Even YouTube can be an issue since you may discover that videos are being watched that you would never normally view.

A hacker may have only accessed your account to grab your details, though, in which case an obvious trace may not be left. Thankfully there is a good way to check if someone has access to your social media account. Check the location of your recent logins (see the boxout). If they are coming from an unknown area or a country that you haven't visited then you will know there is an issue.

If you do find your social media account has been hacked, you need to report it. For users of Facebook, the place to go is en-gb.facebook.com/hacked. The sooner you act, the less likely any further damage will be caused. Who knows what a hacker is doing with your account – he or she could be deleting personal information, contacting people or accessing your private messages.

Facebook will want you to enter your email or phone number, your Facebook username or your name and friend's name. An email will be sent to you with details of how to reset your password but things could become more complicated if your email is also hacked, as we've seen – yet again reinforcing why you should have different passwords for different accounts. Don't think all is lost if this is the case, though: you'll be shown a link to a page that lets you report a more complex case of hacking. It asks you for a new email, which breaks the tie with your hacked email account before going on to assist you in the recovery of the Facebook account.

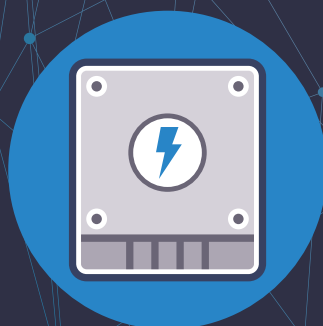


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Instagram offers a similar similar service you can access by visiting tinyurl.com/lbw5kd2, as does Twitter (go to support.twitter.com/forms/hacked and email the ticket number to hacked@twitter.com). Twitter also advises that you go through third-party applications you don't recognise and revoke their access to the service if you fear you've been compromised. This is because apps can be used by hackers to get to your Twitter account via the back door. You can find the options to do this by going to the Apps tab of your account settings and clicking on the Revoke Access button next to the application. It is also worth noting that Twitter wants to know if you have been a victim of a phishing attempt. If you have, send the phishing email to hacked@twitter.com and include the word "Hacking" in the subject line.

How Much?

Things start to become more serious, though, when money is involved. In a lot of cases, hackers are looking for access to your bank details. Many accounts from Amazon to eBay have payment details attached to them so a hacker gaining access to them could change the address, buy items and divert the goods. You get a whopping bill and they get the expensive items that they want.

If changing the password does not work or if you are locked out of your account because the hacker has already changed the password, then you need to contact Amazon's customer service team, which is usually very quick to respond. You should also let your bank or provider know that your credit or debit card could be used fraudulently and ask them to issue you with replacements. Any payments made on it should be refunded depending on how the account was compromised.

Indeed, when it comes to online payment accounts, Kaspersky Lab says people need to regularly check what is coming in and out. Always keep an eye on PayPal, Amazon, Apple Pay and other such payment services for any unauthorised activity and watch out for notifications saying your account details have been changed. Being alerted to suspicious activity on your account gives you an early tip-off that can be crucial in minimising the potential for damage.

If you have not actually authorised a change, then it points to a problem, and suggests that you need to start taking some action. Just be careful to read the emails properly to ensure that they are actually legitimate and, if in doubt, always go direct to the website in question and change the password there rather than through a link.

Affected By The TalkTalk Hack?

If you are a TalkTalk customer, Action Fraud has put together some solid advice on what you need to do next. It says you should change your password, contact your bank and credit card company, keep a check on suspicious or unexpected activity, be wary of phishing emails and people calling for personal information – never reveal bank details or passwords. It says you should check your credit rating at Experian, Equifax or Noddle and report any fraud at www.actionfraud.police.uk/report_fraud.

Cat And Mouse

You cannot fully protect yourself from hackers – you can only make it harder for your accounts to be compromised. It is akin to a game of cat and mouse and no-one can be sure where the next attack will be. People think that anything to do with Apple is 100% secure, but it isn't, especially if you've tinkered with the operating system.

Hackers targeted jailbroken iPhones in September this year, for instance, stealing more than 225,000 Apple accounts using malware called KeyRaider. These details could be used to make purchases, send iMessages, access iCloud data and more. What's more, having access to an Apple ID and password could even allow a hacker to remotely erase a device or permanently lock it. Meddling with something that holds such crucial data will compromise your safety, but if you do jailbreak a phone or tablet, then at least use two-factor verification. It saves you having to mess around setting up a new Apple ID account or, as a last resort, restoring the device to factory settings (do this via iTunes if you are using an iPhone, then restore from a safe back-up and set up a new Apple ID).

Of course, none of this will completely stop accounts from being hacked. As long as there are people who do not secure their machines, the issue will continue. We do tend to be lazy at times and assume that we won't be affected and one of the problems of the modern era is that are devices are almost permanently logged in to services. If you have a strong password set on your computer, phone or tablet, this isn't that troublesome, but it can lead to bad habits – like remaining logged into accounts when leaving work, or even on public computers. Many people also habitually forget to untick the 'Remember Me' box on login pages. Don't be one of those people, though, because the easiest way to compromise an account is to leave the front door to it open. The next computer user could easily change your password or post things on your behalf without you realising it until it's too late. Don't have nightmares... **mm**

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Speak Easy: A Guide To Wireless Speakers

Prick up your ears to
Mark Oakley's guide
to going wireless



◀ Sony's SRS-X55 speaker – choose your colour

The first single I ever purchased was Bon Jovi's 'Lay Your Hands On Me'. On the cover, Jon Bon Jovi showed off his long, flowing locks like a peacock displays its feathers. This was one proud rocker, and I was a very proud young boy for having bought it – with my own money, no less.

Spin on some 26 years later, and you can picture my delight at having dug this bad boy out of my garage during one of my annual attempts at creating some sort of order in my life. As John Francis Bongiovi Junior stared back at me with his sweaty visage, I reflected on how my music habits have changed over the past few decades. Whereas 'Lay Your Hands On Me' was a 7" slice of vinyl joy, now the vast majority of my music purchases are carried out over the internet (the last physical music outlet in town is HMV and all the independents have gone to seed), and nine out of ten of those purchases are in a digital format.

“ Why choose an old, wired speaker setup when you can look to the future with new, wireless speakers ”

I do occasionally still buy CDs from time to time, but that tends to be if it's a particular artist I'm fond of or if it's a special edition release. But on the whole, I've pretty much become a slave to digital audio formats, and I'm not alone. Digital music revenues overtook physical sales for the first time last year as Apple, Google, Spotify, Deezer and a number of alternative services took control.

Buying digital music has become so easy that the success of these services has left record players and CD systems gathering dust. Now, thanks to better wireless networks, the stand-alone wireless speaker has become the popular plaything for audiophiles.

Why choose an old, wired speaker setup when you can look to the future with new, wireless speakers that take advantage of the latest technology, giving you total control over your digital collection and allowing you to unleash it around the home?

The thing with the wireless speaker market is that since it's taken off so well, the options are plentiful and somewhat confusing. Bluetooth, AirPlay or wi-fi? Multi-room system? Spotify support or not? Can you really get a good sound from a speaker that small? Is £100 going to get you anything that truly fills a room with sound? Let's find out.

Which Streams Best?

The single biggest question when it comes to buying wireless speakers is which streaming technology you should choose. As always, the answer isn't as straightforward as it might seem.

Bluetooth

Bluetooth speakers are the most popular wireless speakers on the block. This is chiefly because Bluetooth technology can be found on any mobile device you care to think of, so Bluetooth speakers will work with pretty much any smartphone or tablet on the market, alongside desktop and laptop systems.

Bluetooth On A Budget

As it's the most popular, widely adopted wireless speaker standard around, Bluetooth also comes with the most options for all budgets.

Among the big brands, Sony has a solid reputation in this area, and it's recently revamped its range of Bluetooth speakers that aim provide a solution for any user. From the SRS-X11 (£69) to the SRS-X99 (£599), the range of fully portable speakers is backed up in the upper-end of the range by wi-fi and AirPlay support alongside Bluetooth. Sony's styling is spot on with this range too, and the addition of nice touches such as touch-sensitive controls and NFC connectivity with supported smartphones make for a potent, powerful mix. Audio-wise, I've tested the SRS-X55 (£159), and the rich bass and 2.1-channel audio output easily fill a small or medium room. I did experience connectivity problems when using it in my home office, as it didn't seem to like competing with my Bluetooth devices already connected to my Mac. However, when I tested it in the kitchen and bedrooms away from my desktop, the audio results were fantastic, with powerful bass and clear, standout vocals.

The speakers at the higher end of the range also support multi-room setups thanks to the SongPal app, but the starting price of the speakers for that is £259 for the 40W SRS-X77.

Bose also offers a strong line-up with its SoundLink range. The SoundLink Mini Bluetooth Speaker II costs around £170, and the rechargeable battery offers around ten hours between charges. For what's a relatively small unit for the power output (it's only around 18cm long), the reviews surrounding this are pretty much universally positive. You can't pair two of them together, but you might not need it, because this provides a surprisingly powerful and capable sound for the money.

At the lower end of the spectrum, you'll find Bluetooth speakers in supermarkets and high streets everywhere, but if you want a speaker that's going to make your music sing rather than warble, avoid the cheaper end of the market. That said, for less than £100, you could pick up Denon's Envaya Mini, which might not have the greatest battery life in the world (consumers seem to report around five hours), but the audio quality of anything backed by Denon should be pretty solid. Alternatively, for less than £50 (and you can actually pick up a pair for a tenner if you look around), you could have X-Mini's Max Duo pair of speakers for a stereo upgrade for your smartphone. The audio on these won't blow anyone away, but for background music at a picnic or a park, they're surely worth a look.

For a little history lesson, Bluetooth has been around since 1994, when Ericsson came up with the concept as an alternative to cables. Transmitting data over short distances using radio transmissions, Bluetooth operates in the 2.4GHz band and has the widest spectrum of uses of any wireless technology. Cars, smartphones, medical devices and everyday household objects all use Bluetooth to connect to each other, and due to its popularity among manufacturers, Bluetooth



▲ *The Bose SoundLink Mini Bluetooth Speaker II*

speakers are plentiful. There are also several good reasons why Bluetooth has become so popular.

Bluetooth – The Good

Portability: The biggest draw behind buying Bluetooth speakers is that the technology is completely portable. If you want to take your speaker with you on holiday or on a business trip, you can do that with a battery-powered Bluetooth speaker and you don't need any wi-fi signal to listen to your music either – assuming you have some music stored locally on a Bluetooth device.

“ **Bluetooth speakers are the most popular wireless speakers on the block** ”

One size fits all: Bluetooth works with all mobile devices across all platforms. So whether you're iOS or Android, HTC, Apple or Samsung, you'll be able to connect to Bluetooth speakers. This eradicates any worries about which brand you should buy.

Low power: Bluetooth speakers typically consume surprisingly little power, so you often don't need external power adapters to run them. Another feather in the cap for the portability argument, this also means that Bluetooth speakers tend to come in all shapes and sizes, right down to teeny devices of just a few inches.

Brand-tastic: As the technology itself is so far-reaching, the number of companies and brands (big and small) developing Bluetooth speakers has grown. With a breadth of choice that's

wider than rival options, if you want to follow your favourite brand, Bluetooth is likely the way to do it.

Cost: Because of the wide range of speakers on offer, Bluetooth tends to offer the lowest prices, although that often comes with caveats regarding audio quality or battery life. Still, if you're on a budget, it may be the best way to go.

Bluetooth – The Bad

Audio quality: While portability is arguably Bluetooth's biggest strength, it also comes with a significant downside. The audio quality of some of the smaller, less capable Bluetooth models can leave a lot to be desired. A speaker with a subwoofer or bass/treble controls is typically something you'd want to look for if you're going to use your speaker for serious, long-term listening.

Also, Bluetooth uses lossy compression to transmit audio over airwaves and while that has certainly improved markedly over the years since Bluetooth was first introduced, audiophiles would still argue that it isn't up to par. In this respect, the aptX codec is worth looking out for, and more companies ranging from Sony, Denon and Creative are using this in their speakers, because it promises a higher quality of audio.

Power: This is a particular problem for portable speakers without their own power supply. I've purchased and tested a few portable, budget Bluetooth devices over the years, and I've been left seriously disappointed with the power output and, therefore, the range of the audio.

Bluetooth – The Ugly

In-home interference: The biggest problem with Bluetooth (and this was a deal-breaker for me personally) is the spectrum on which Bluetooth operates. This might not be a problem for you if you have a dual-band router at home, but I'm stuck with my 2.4GHz router for my home broadband, and when I recently trialled one of Sony's latest Bluetooth speakers, I was endlessly frustrated with audio dropouts, as my Mac and

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“ Bluetooth speakers typically consume surprisingly little power ”

other devices were interfering with the speaker's output. I've had problems with other Bluetooth speakers I've used in the past in this respect too and the placing of your Bluetooth speaker in a home environment is all-important on this score. In the kitchen, with fewer devices to interfere with, Bluetooth speakers work very well. In my home working environment, Bluetooth speakers have proven a frustrating experience.

My advice? If you have a dual-band router at home, switch to the 5GHz band if you can to avoid Bluetooth interference. Other than that, it's a case of trial and error; change your wireless channel on your router and experiment with different room placings for the speaker itself.

AirPlay

If you're not an Apple user, this next section is obviously not aimed at you. It would be impossible to ignore the Apple device market, though, and AirPlay has become the go-to screen-sharing technology for Apple tablet and smartphone users.

Once it was adopted on wireless speaker systems, Apple knew it was on to a winner with its proprietary technology. AirPlay was first introduced in 2010, and over the last few years manufacturers have harnessed the full functionality of the wireless streaming feature. Working over wi-fi networks, AirPlay has two active components for it to work: a source

AirPlay's Big Hitters

Apple's AirPlay speaker partners include B&W, Harmon Kardon and Libratone. The bottom line, then, is that you're going to have to pay for the audio quality that you'd expect products from these types of partners to provide. One thing to say from the off is that every single AirPlay speaker I've seen on the market looks outstanding, with high build quality the norm. The problem is that you really are having to pay big for that branding and quality, though.

The Libratone Zipp is unique (if rather gimmicky), in that it comes in a range of zipped-up covers to hide the tweeters, woofers and drivers inside. Fortunately for the Scandinavian manufacturer, this isn't just about the looks, as reviews suggest strong audio to go with a speaker that would enhance the look of any home. Alongside AirPlay, the Libratone now also provides wi-fi and Bluetooth support.

For £700, you could go all out on B&W's A7 speaker, a powerful 150W single speaker that's by all accounts a cracker to listen to, but is ultimately for Apple devices only. Also from B&W, the newly released £499 Zeppelin Wireless provides AirPlay and now Bluetooth support, as well as Spotify Connect built in (you need to be signed up for Spotify Premium for this to play tunes from Spotify through the speakers). For far less money, you could always try the SmartSpeaker (thesmartspeaker.com) for around £150 if you shop around. Some reviews have suggested you'll need two of them for a proper stereo setup, however.

and a receiver. The source is an Apple device running AirPlay-enabled software to stream media; the receiver is an AirPlay device that plays that media, along with metadata such as track information. One source can output a stream to multiple AirPlay-compatible devices.

AirPlay – The Good

Network based: Being on a home network has the major advantage of being able to handle a much improved range over Bluetooth. There are no point-to-point worries here, and you'll be able to walk around a room and position your speakers in a far wider variety of spots without any impact on audio quality, provided your AirPlay devices (source and receiver) are on the network.

Simultaneous streaming: AirPlay speakers provide a handy option for a multi-room audio solution – something Bluetooth cannot provide, because it's an in-room solution only due to its limited range.

Not just music: If you have an Apple TV, you can set up your AirPlay speakers to output audio, so if your TV happens to have pretty bad audio quality, no matter, because AirPlay has you sorted.

Lossless compression: AirPlay provides lossless streaming, and generally AirPlay speakers' audio quality is very good.

AirPlay – The Bad

Network based: You need a good quality wi-fi network setup in order for AirPlay to be a success. That's not a big problem for the vast majority of us these days, but if you're unfortunate enough to have a substandard wi-fi home network with



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TECHNOLOGY





◀ A couple of Play:1 speakers

dropouts and low bandwidth, don't expect AirPlay to solve your problems.

Home based: AirPlay speakers are reliant on wi-fi, so they're not portable. You won't be taking these down to the local park with you to accompany your football match. Ultimately, this one comes down to what you want out of your wireless system and how you're going to use it, but AirPlay's functionality is more limited than Bluetooth's.

AirPlay – The Ugly

Cost: Proprietary technology comes with its own set of licensing and development costs, and that works out as more expensive than its rivals. Apple users will be used to paying for the company's products by now, but AirPlay speaker systems really are not cheap, starting in the low hundreds and rising to the cost of a dedicated and frankly superior wired home system. You're paying for the convenience of them 'just working', which isn't even always the case, because there are also occasions when this streaming technology throws a wobbly, just like audio dropouts occur on Bluetooth.

Apple only: You cannot use AirPlay products with any other brand. If you're a total Apple convert, then this isn't necessarily a problem at all, but if the idea of having all your eggs in one basket doesn't sit well with you, then AirPlay isn't going to help you.

Sonos Still On Top

For dedicated, multi-room setups, Sonos remains the brand to beat, more so when it launched its Play 1 speaker for less than £170. Providing an entry point for consumers at a price that's not ridiculous, Sonos made itself available to a much broader consumer base. I have a Play 1 speaker myself and it's an absolute joy to listen to. Setup is a breeze, it supports a wide range of online streaming options, with hundreds of radio stations available for free, alongside support for the paid-for versions of Spotify, Deezer, Qobuz and many more. If you want to buy more powerful speakers, the company has just relaunched its flagship Play: 5 speaker, now with TruePlay technology for superior sound calibration around a specific room setup.

I haven't been lucky enough to test Sonos's alternatives – chiefly the well-received Bluesound range – but I can say that I'm delighted with the system. The Sonos Controller app is well thought out, and the ability to add more speakers to the system for a multi-room system is hugely appealing further down the line (although the Play:1 fills a small- to medium-sized room wonderfully). At one point, Sonos was pretty much the only game in town in multi-room setups, and although that has changed in recent years, the firm still knows what it's doing.



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A fresh take on technology

Dedicated Multi-Room Wireless Setups

Sonos has become the wireless streaming market's big player. Founded in 2002, the brand has gone on to develop speakers that cater for any home setup you can think of, and the big draw here is multi-room. Having the ability to play audio across speakers dotted around your house simultaneously, or to play different audio to each speaker and being able to fully control each one independently has appeal.

Other brands in this market include Bluesound, which has garnered fantastic reviews for its audio quality, and Pure's Jongo system, which can use wi-fi or Bluetooth.

These systems come with their own dedicated apps as well, meaning you can control your audio remotely via your smartphone or tablet.

The Good

Music services: Dedicated systems from Sonos and Bluesound don't only stream audio from your sources. They also come with built-in music services from the likes of Spotify, Qobuz and Deezer, the latter two providing lossless audio streams on the Sonos system. You'll have to be signed up to these services, of course, but the chances are that you could very well be signed on for the premium services in any case. Being able to access them directly through these systems is certainly a huge plus.

Audio quality: Marketed as providing hi-fi-quality audio around the home, these systems theoretically provide the best audio quality compared with rival speaker systems. They also provide a big sound, easily filling a room even with the entry-level speakers they provide.

Connectivity: The multi-room setup is no longer a scary weekend project. Buy a few speakers from these manufacturers, set up the software on your desktop, laptop or mobile device and within a few button presses, you have yourself a multi-room system you'll be proud to show off to your friends and family. These setups were designed to speak to each other, so the potential for upgrading down the line and adding bits to your system is also easy.

Worth boasting about: They do look, sound and feel truly wonderful. You'll be the one hosting all the parties with these systems.

The bad

A very specific set of skills: These are dedicated systems for a dedicated purpose. If a multi-room setup isn't what you're after, you'd be better serviced with a single, high-quality speaker.

Self-contained ecosystem: Taking Sonos as an example, the entire system – hardware and software – is a bespoke, dedicated one for that setup. As with Apple's iTunes, if that isn't to your liking, then this could put you off. Ultimately, once you buy into this kind of system, you're locked in. It's not like using a Bluetooth speaker, which is for more flexible in its usability. I have to say that personally I think the Sonos software is excellent, but that doesn't mean to say it's for everyone.

The Ugly

Cost: There's no getting around it: once you begin to add up the cost of putting a multi-room system together, it's probably going to cost you more than a superior sounding, wired setup

Chromecast Audio: Cheap Upgrade For Old Hi-Fi

Recently, Google announced the Chromecast Audio device, a dongle that plugs into a standard hi-fi speaker (via standard 3.5mm, RCA or optical cable), and then connects to your wi-fi network so you can stream audio to it. Costing just £30, this could be the perfect entry point into music streaming for people who don't want to spend too much money from the outset. It's not going to compete with the usability and audio quality of dedicated systems, but it's not trying to. What it certainly could do, though, is find real success in much of the lower end of the market.

“ Whichever streaming solution you decide to opt for, there are clearly benefits and negatives to all of them ”

around your home. You're paying for the convenience of being able to control your music remotely, but the cost can approach well over £1,000 quite easily when you start putting a few speakers together. Whether you think it's worth that spend depends on how highly you rate music streaming and whether you're prepared to compromise (slightly) on the audio.

Summing Up

Whichever streaming solution you decide to opt for, there are clearly benefits and negatives to all of them. Much of your decision will likely come down to how you want to use wireless speakers, and once you've determined this you'll be in a much better position to discard many of the numerous options on the table.

If it's a portable system you're after, one that you can take with you to parties, weekend breaks etc., then Bluetooth is really the best route. Likewise, if you're on a budget, then Bluetooth certainly has the greatest variety of prices. If you're an Apple user through and through, then AirPlay may very well be your choice, because it's built to work around iOS. If it's a multi-room solution you want, then your options are increasing all the time and the hardware that's available is generally fantastic for the job.

Have a look at some of the suggestions dotted around these pages for inspiration, and when you buy a product, make sure you fully test it. If it isn't performing as you'd expect, keep the original packaging and your receipt and take it back to the store for advice, an exchange or even a refund. The important thing here is to make sure you're returning it for the right reasons, and that's why it's important to know what you want out of a wireless speaker before you go any buy one.

Go forth and research, people! Unleash that inner Bon Jovi. [mm](#)

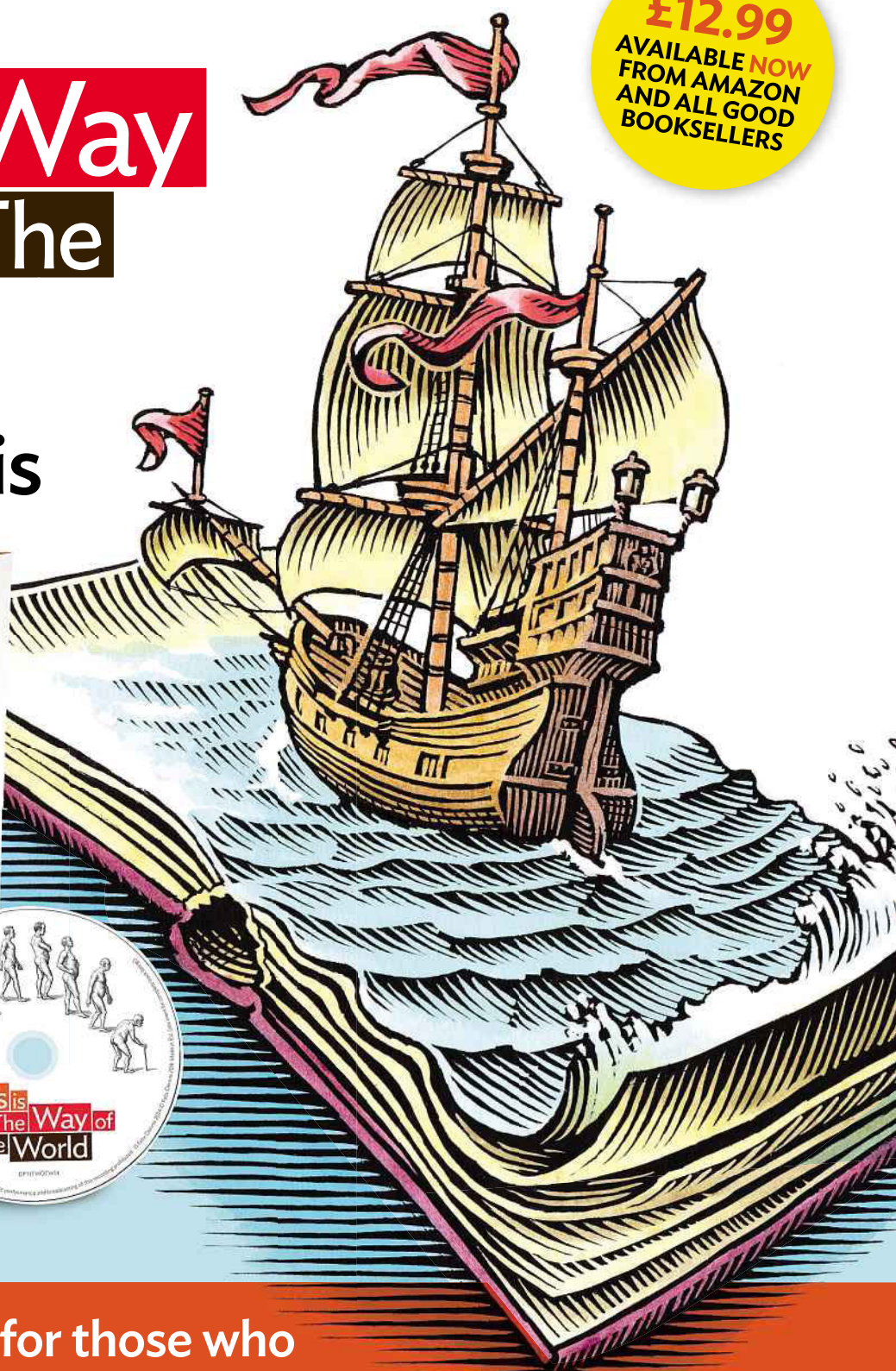
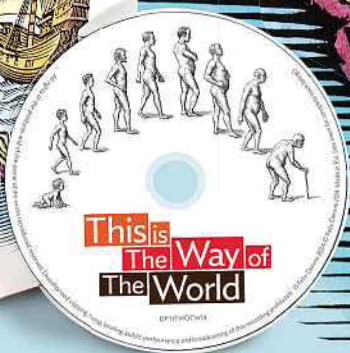
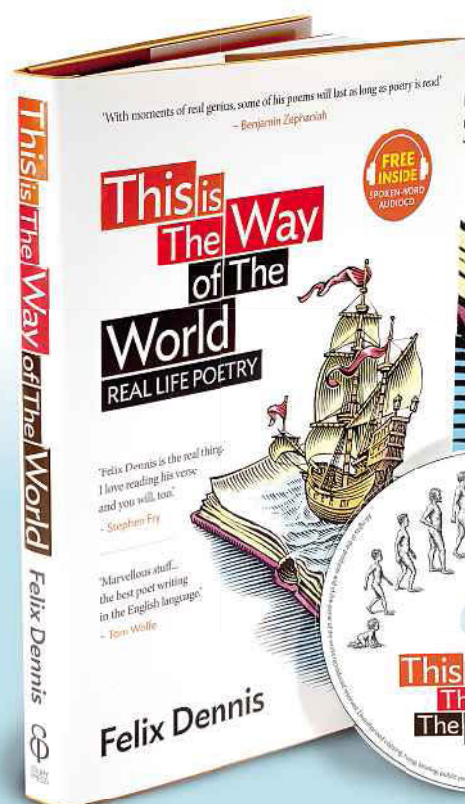
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Raspberry Pi CamJam EduKits

David Briddock explains why CamJam EduKits are perfect for novice hardware hackers

Jam events are packed with people having fun with Raspberry Pi technology, albeit fun with a heavy educational flavour. Attend one of these events, and you can't help but be impressed by the possibilities and drawn in by the high levels of enthusiasm and innovation.

However, there's a perennial problem: working out how to get started. To overcome this hurdle, the CamJam organisation has launched a series of educational Pi kits, which offer an affordable, easy-to-understand introduction to hardware hacking.

CamJam

The Cambridge Jam organisation, aka CamJam (camjam.me), is one of the most popular and forward thinking Raspberry Pi Jam setups in the country. One of its key advantages is that the event takes place in the Raspberry Pi Foundation's home town, so CamJam events always attract an impressive line-up of high profile speakers, like *Adventures in Raspberry Pi* book author Carrie Anne Philbin (goo.gl/fcRL4X). Sometimes

even Pi Foundation founder Eben Upton (goo.gl/WavWah) makes an appearance.

CamJams attendees feel the excitement of electronic circuit building and discover how to interact with the various electronic components, LEDs, buzzers, sensors, motors and so on, using hand-crafted Python code. And they can witness that wonderful sense of achievement and pride that light up a maker's face, whatever their age, when a new project springs to life.

Low Cost

Cost is a critical element for schools when considering classroom equipment, like Raspberry Pi kits and accessories. Too expensive and they won't be available in sufficient numbers for whole-class exercises – or maybe even bought in the first place.

As you'd expect, CamJam is keenly aware of this issue. That's why EduKits start from a very pocket-friendly £5. Great news for cash-strapped schools and for parents looking for birthday or Christmas present inspiration.

CamJam has established commercial arrangements with the Pi Hut (thepihut.com/edukit) to distribute the kits. Unusually

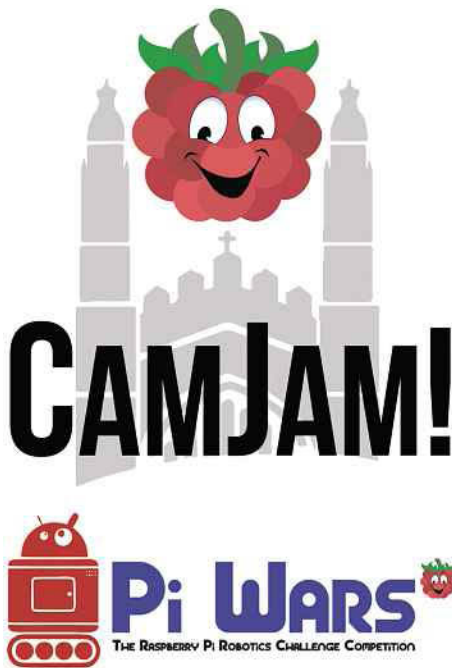
for a commercial arrangement, this deal ensures any profits raised by sales are ploughed back into future CamJam events, educational initiatives and the Pi community.

Easy Start

One of the problems that beginners to electronic circuitry construction face is soldering. While it's certainly a useful skill to have, it does take a little time to master. Along the way, some electronic components may be overheated, destroying their function. More importantly, a soldered circuit precludes later modification and experimentation.

With this in mind one of the main drivers behind each EduKit is to adhere to a 'no soldering' construction methodology. Instead the various component wires are pushed into ready-made slots in a small prototyping breadboard, where the outer rails provide power and ground connection points.

This is a perfect scenario for the novice circuit builder. If a mistake is made (say an incorrect resistor location or an LED component placed the wrong way round),



▲ CamJam EduKit 1

the offending component is simply pulled out of the board, then pushed back in correctly.

Of course, you'll need to write some code to control these circuits, but they're typically quite short programs, sometimes just a few lines. And each kit has a number of fully explained code examples written in the popular Python language.

Free Worksheets

In addition to the kits themselves, CamJam supplies a number of downloadable, step-by-step worksheets for each EduKit. This means you can investigate the sort of electronic projects you can tackle with each kit before you buy.

Each worksheet has a high-level project description, a project component list, breadboard wiring diagrams, example Python code and an explanation of how the code works. And every worksheet for every EduKit is freely available to download from **camjam.me/edukit**.

However, there's nothing particularly special in terms of an EduKit's electronic components, so if you prefer, you could source your own breadboard and components, then download one or more worksheets and use the instructions to build the electronic circuits and associated controller code.

And, what if you're a teacher? Well, there's nothing to stop you using a worksheet as the foundation for a maker-style information technology lesson.

Now let's dive into each of three EduKits currently announced to discover their scope, the components they contain and the associated worksheets.

EduKit 1

The very first EduKit is purposefully designed to establish a gentle yet rewarding start to Raspberry Pi hardware hacking.

Open the CamJam EduKit 1 presentation tin (see image), and you'll find a neatly packaged selection of components (see the EduKit 1 Contents boxout), carefully chosen to begin your journey into electronic circuit building and Pi-based control.

While the component list isn't huge, there's plenty of fun things to try, as can be seen in the eight EduKit 1 worksheets (as discussed below). In addition, the very same components can be reused to build other interesting electronic experiments. And all these components come in handy when you're experimenting with some of the more advanced kits.

EduKit 1 Worksheets

As we mentioned earlier the kit is accompanied by a set of downloadable worksheets, a total of eight in this case.

EduKit 1 worksheets show you how to light up LEDs, handle button presses, make a buzzer go beep, simulate a set of traffic lights and even explore some simple game scenarios.

The full list of EduKit 1 worksheets are:

- Hello world
- Basic LEDs
- Blinking LEDs
- User Input
- Button
- Buzzer
- Traffic Lights LEDs
- Games

These worksheets are compatible with the original and new Raspberry Pi models. Just remember that on later models (such as on the Model B+ and Pi 2), where the GPIO pin count is larger, the first 26 pins are identical to those found on the earlier Model A and Model B.

EduKit 2

Although EduKits are often announced at the CamJam event, full availability invariably happens later the same year. The timing often coincides with the PiWars event (**piwars.org**) held every December at the Cambridge Computer Centre.

Links

- CamJam Home: camjam.me
- CamJam EduKits: camjam.me/edukit
- CamJam mail list: goo.gl/NxOnWi
- Pi Hut EduKits: thepihut.com/edukit
- 4tronix: 4tronix.co.uk

EduKit 1 Components

- 1 x breadboard
- 1 x red LED
- 1 x yellow LED
- 1 x green LED
- 1 x button
- 1 x buzzer
- Resistors
- Jumper wires



▲ CamJam EduKit 2



▲ CamJam EduKit 3

EduKit 2 was indeed launched at PiWars 2014. Once again, there's no soldering required to build any of the projects. Instead, each quality component can be neatly inserted into the breadboard slots.

As you see in the package components (see the EduKit 2 Contents boxout), there are quite a few more items to play with. Nevertheless, EduKit 2 still only costs £7. Note the 14 jumper wires are divided into ten male/female and four male/male types, to cope with both breadboard and GPIO connections.

EduKit 2 Worksheets

This time, there are just six worksheets, but the enhanced component list ensures the type of projects you can build with EduKit 2 are a step up from EduKit 1.

The full list of EduKit 2 worksheets are:

- Hello world
- LEDs and Buzzer
- Temperature
- Light
- Movement
- Alarms

Some worksheet instructions (for example, the Temperature one) differ depending on the Pi model you own, so you'll need to read everything carefully to ensure everything works as expected.

As usual, all the worksheets are freely available to download from camjam.me/edukit, and there's additional information online (see the Links boxout), which demonstrates how to apply these worksheets to real-world applications. Ideas include a bedroom burglar alarm, a frost temperature alarm and a low-light triggered LED lamp.

Of course, if you merge EduKits together it's possible to build even more ambitious projects.

EduKit 3

During CamJam 2015, organiser Tim Richardson and the Pi Hut representative Jamie Mann announced the new EduKit 3. Unlike the first two EduKits, the third incarnation has a specific focus. This time it's all about robotics.

A quick glance at the component list (see the EduKit 3 Contents boxout) confirms that it has all the electronic elements necessary to build your own motorised, environment-sensing robot – and the whole thing comes packaged in a sturdy two-part cardboard box.

Once again, CamJam has managed to achieve fantastic affordability. EduKit 3 costs just £17 plus delivery, which is £2 with a Pi Hut order. In other words, it's quite possibly the cheapest robotic kit available in the UK.

As always, this is a non-soldering kit to ensure anyone can follow the robot construction instructions. This means both DC motors come with pre-soldered wires (which are shrink-wrapped for protection and sturdiness). And thanks to partner 4tronix, the motor controller board is also pre-soldered and incorporates ready-made GPIO connectors.

The only extra bits you'll need are some sort of chassis and four AA batteries to power the motors. The chassis could be anything you like, even something as simple as a cardboard/plastic box lid or a ply-wood off-cut. It's an opportunity to be imaginative and make your robot unique, so maybe you'll decide to design your very own 3D-printed creation.

The only disappointing news is that the kit won't be available until later this year. As you'd expect, CamJam is determined to have lots of EduKit 3 boxes on sale at the December PiWars event, which itself features an impressive array of Pi-powered robots for the various competition classes.

From the information released so far, it seems a November 2015 date is most likely. This is also the time when we can expect to see the associated robotic-project worksheets appear on the CamJam website.

Considering adding a Raspberry Pi robotic kit to your Christmas 2015 present list? Then keep a lookout for news on the CamJam and Pi Hut websites. Or sign up to the CamJam email list (goo.gl/NxOnWi) to be notified when EduKit 3 hits the shelves. [mm](#)

UduKit 2 Components

- 1 x breadboard
- 1 x immersible temperature sensor
- 1 x PIR sensor
- 1 x LDR
- 1 x Active buzzer
- 1 x red LED
- 1 x blue LED
- 1 x 4.7K resistor
- 2 x 330 resistors
- 14 x jumper wires
- 1 x presentation tin

UduKit 3 Components

- 2 x red wheels
- 1 x ball-caster third wheel
- 2 x DC motors
- 1 x motor controller board
- 1 x battery holder
- 1 x line follower sensor
- 1 x ultrasonic distance sensor
- Resistors
- Jumper wires

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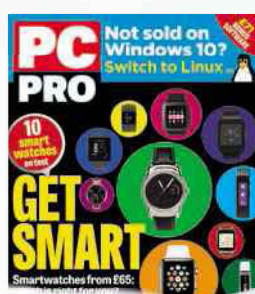
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Remembering... BASIC

David Hayward recalls writing programs that insulted classmates

There's a popular educational movement at the moment to get the current generation of students back behind keyboards and programming. The likes of the Raspberry Pi and the attention attracted by the BAFTA Young Games Designer and Concept awards has somewhat helped to force a change in the curriculum.

In many ways, you could say that the programming revival of the 80s has come back around and is enjoying a new found fame, buoyed by many new programmable boards and utilities designed to get children into programming.

Of course, those of us who are a little long in the tooth will recall the programming boom of the 70s and 80s, sat in front of our ZX81s, ZX Spectrums, C64s and so on at home, tapping out a lengthy string of code into the wee hours. There was also the coding in the classroom, though, with six of us huddled around an overheating BBC Micro trying to work out the error in the thousands of lines of code we'd spent the last six months entering.

To some, Assembly was the way forward. A hardened programmer knew their machine code, but for the rest of us, BASIC was king.

The vast majority of you reading this will no doubt recall going into the local Tandy or Woolworths and playfully entering:

```
10 print "Mike smells!"
20 Goto 20
>Run
```

Of course, you'd substitute 'Mike' with some other poor kid, whose time it was to have

their name scrolling down the screen for the general public to view.

That was the essence of BASIC back in the day and although a lot of folks never got past that point, some of us did indeed try to program some form of a game from the many-lined commands at our disposal.

Its History

BASIC (Beginner's All-Purpose Symbolic Instruction Code, as if you needed telling) was actually invented, or rather designed, in 1964 by John Kemeny and Thomas Kurtz of Dartmouth College in Hanover, New Hampshire.

Back then, the majority of programming was done with punch cards or by physically turning one of many dials on a mainframe. However, BASIC was designed for those who were less technical, but still wanted to get the computer in question to complete a task.

It was based on Fortran II, with a few ingredients from some other programming languages around at the time. It was logical, mathematical and was perfect for teaching the then generation of students how to interact with the many mini computers that were being adopted by schools, colleges and universities around the world.

Of course, it proved to be so popular that it was soon integrated into the operating systems of the home computers that started to emerge in the late 70s and early 80s. The more notable ones were the Sinclair, Commodore and BBC machines, the latter of which had the remarkable ability to mix both BASIC and Assembly in the same code structure.

Did You Know?

- Kemeny actually contributed to the Manhattan project and was Einstein's mathematical assistant.
- Not everyone liked BASIC. Some even believed that computing shouldn't be made easier for everyone to have access, and that non-scientists or even women using a computer was asking for trouble.
- The Goto statement was one of the most hated commands among the anti-BASIC crowd. It created a messy, spaghetti code, they said.
- Three of the first home computers that came with BASIC were Apple II, PET 2001 and the TRS-80.

Even DOS enjoyed its own version of BASIC, which kept the language alive well into the modern PC era. Microsoft went a step further with Visual Basic, evolving the base language while still leaving links to its heritage.

These days, though, it's not as common as it once was. Things like Python and Java have taken precedence, with better support for multiple platforms, as well as offering more scope for programmers.

The Good

It was remarkably easy to use, and you could pick it up very quickly. It didn't need extra compilers and so on; it just worked.



▲ BASIC could be as complex...



▲ Or as childish as you wanted it to be



▲ John Kemeny (left) and Thomas Kurtz (centre) with a student learning BASIC

Component Watch

Looking to add some Bluetooth functionality to a PC or laptop? Have at it!

Bluetooth is popular in laptops, smartphones and tablets – but what if you want it in your desktop? Adding extra connectivity to your PC doesn't mean you have to do anything complicated – all you need is a free USB port and you'll barely notice it's there. Bluetooth adaptors are available for next to nothing, but what if you want the benefit of a brand name (and guaranteed standards compliance) backing them up? We took a look at some of the devices on offer.

Deal 1: Dynamode BT-USB-M2

RRP: £5 / Deal Price: £2

This super-cheap adaptor is fully Bluetooth 2.0 compliant, which explains its low price – as most modern devices use the more versatile Bluetooth 4.1 standard these days. Still, if you've got old devices that wouldn't benefit from a faster connection, or you really are desperate to save yourself a few quid at the expense of a bit of lost bandwidth, you won't find cheaper than this.

Where to get it: Kikatek (bit.ly/1NazVlk)



Deal 2: Startech Mini USB Bluetooth Adaptor

RRP: £12 / Deal Price: £10

Startech's version of a Bluetooth 4.0 adapter is available for only a little more than the Asus and Belkin versions herein, and offers many, if not all of the same features. All things considered there's no particular reason to dismiss it, but reputation alone suggests that one of the ones you'll read about on the right hand side of this page will have the edge. Startech is known for its budget networking hardware, and when you can find bigger brands at smaller prices, it's got little to recommend it. Despite that, if you can only find this (or you need to pop into you-know-where to grab something quickly) then there's no reason to actively avoid it. It actually works, and that already makes it better than some cheaper, unbranded adaptors.

Where to get it: PC World Business (bit.ly/1RfWtqu)



Deal 3: TRENDnet TBW-107UB

RRP: £10 / Deal Price: £7

This Bluetooth 2.1 dongle costs considerably more than Dynamode's 2.0 version, but that .1 makes a difference to compatibility, allowing support for seven simultaneous devices, a 10-metre range, and providing secure simple pairing so it's easier to connect devices. At £7 it's still a bargain – small, discrete and ultra-compatible, its performance is more reliable than unbranded alternatives, and ultimately that's worth paying extra for.

Where to get it: Pixmania (bit.ly/1MWe8j8)



Deal 4: Asus USB-BT400

RRP: £22 / Deal Price: £10

The king of high-quality wireless peripherals brings its skills to this low-price Bluetooth 4.0 adaptor. Backwards compatible with earlier versions of the standard, it supports Bluetooth Low-Energy (BLE) connection as well as the superior connection speeds and range of its more advanced standard. Chances are if you're looking for a Bluetooth adapter, this will do everything you want. The discount is nominal (try finding for RRP), but the value is definite.

Where to get it: Currys (bit.ly/1XBhQq0)



Deal 5: Belkin USB 4.0

RRP: £22 / Deal Price: £10

Belkin's adapter is normally a little overpriced, but if you shop around you can find it for a fantastic discount. Its Bluetooth 4.0 support is comprehensive and the device itself is compact, and compatible with both Mac and Windows systems. Normally far too expensive to recommend despite its strong brand name, if you're quick enough to catch this discount then there's no question you should go for it!

Where to get it: Ebuyer (bit.ly/1Mvyplj)





Europe Is Done Roaming

Cyber Fraud? Phishield Has You Covered

First of its kind

What with all the recent news stories surrounding online fraud and cyber attacks, it seems rather apt that we should receive an email in our inbox regarding what claims to be the world's first cyber and phishing Loss of Funds insurance.

Covering for financial losses due to unauthorised transactions on your accounts, Phishield is re-insured by Lloyd's of London and promises peace of mind for everything you do online. It also claims to work in conjunction with all leading brand internet security solutions, offering various levels of cover (up to £10,000) against financial losses. The cover is valid on any personal

account and protects against online purchases, cash machine withdrawals, EFT Fund transfers, card fraud, phishing scams and in-app purchase fraud, with prices starting at £25. Head to www.phishield.co.uk for more details of this.



National Crime Agency Wants £20m Hackers

Banks on alert over data harvesting

The National Crime Agency is on the look out for cybercriminals who stole over £20m from bank accounts in Britain using Dridex malware to harvest online banking details and chip away at funds. The Agency is reportedly working with the FBI in order to get their me, and one of the alleged hackers has actually already been arrested.

The malware concerned came disguised within a document that was then emailed to the victims, tricking them into installing it and then going about its snooping work. Nasty stuff. Thousands of systems were affected and the minimal transactions made in each account have meant that they got away with the fraud for a good while.

Finally!

And so, and much talking and many promises, it's finally happened. The European Parliament has voted to end of mobile data roaming charges – and with it, should come the end of bill shock.

A deal to scrap roaming charges across the EU was actually agreed earlier this year, but now that MEPs have voted on the matter, it's going to

be brought into law that mobile operators can't add on additional amounts for customers using their mobile devices while travelling abroad within the EU.

The bad news? The change won't be binding until 2017. Honestly, have you ever known a government policy that didn't take an age to be put into place?



A couple of months ago, I received an odd email from an acquaintance, telling me that he'd been stranded in a foreign country and needed me to transfer some money to him. Two things immediately told me this wasn't real. One, we're not so close that he'd ever ask me, of all people, for money. And two, he's a writer, and the terrible grammar and spelling in this email would make him shudder.

Clearly, his account had been accessed by an unauthorised third party. In other words, he'd been hacked. He's not the first person I've seen this happen to, though, and Facebook hacks seems to be particularly popular.

Of course, there are steps you can take to prevent this, and it pays to be cautious. Sure, you can never be 100% secure, but you can limit the chances that you'll be a victim of hacking. Make sure you have strong, unique passwords, and hopefully, it won't be your account that's used to scam your friends.

Until next week...

Anthony

Editor

TalkTalk CEO: We're Not Legally Required To Encrypt Data

Un-wise words

When your company becomes the headline story for online encryption and fraud issues it might be a good idea to eat some humble pie and apologise profusely.

In fairness to Dido Harding, CEO of TalkTalk, she has apologised – a lot – and was quite frank about the scale of the matter. However, it seems that much of the work done in trying to address the issue may have been for naught as she was quoted in the *Sunday Times* as saying that TalkTalk wasn't "legally required" to encrypt customers' data.

She is technically correct. However, if getting customers to stick with the company is the idea, perhaps the best way to do that is to... er, not come out with comments like that?

Ultimately, the data stolen from its servers wasn't encrypted, but the company said that the scale of the hack wasn't actually as bad as first thought. Credit card data information was stored in incomplete form, but that's precious little relief for anyone affected by this. The last we heard before writing, a 15-year-old boy from Ireland had been arrested and released on bail in connection to the hack. Wow.

Meanwhile... On The Internet...

It's another of those weeks where we get to report on a massive hack, we're afraid – although, frankly, that's starting to feel like every week nowadays. You'd probably have to have been under a rock (or, oooh, we don't know, maybe at a holiday camp in Cornwall with your offspring enjoying their half-term) to have missed the details of the continued woes of TalkTalk, and the latest in a series of hacks that have seen its customers' details make it out into the wild (tinyurl.com/MMnet87a).

Understandably, questions have been asked about TalkTalk's data security measures, but also about its reaction to the hack, which saw it take a little over 24 hours to confirm the reason its site had been taken down (tinyurl.com/MMnet87b) and begin to explain what data it believed had been compromised. The bad PR got worse with news that it was insisting on charging a 'leaver's fee' of up to £245 to customers wishing to end their contracts early in the wake of the attack (tinyurl.com/MMnet87c). Then it moved on to doubling down on the assertion that it wasn't obliged to encrypt user data – regardless of how sensible a measure that may appear (see p35 for more on that little nugget of PR tin). Then it took a further nine days to release specific figures regarding the number of people affected by the incursion (tinyurl.com/MMnet87d).

That last link, and the hacking feature you'll find at the front of this very magazine, covers a lot of the things people can do if they're concerned they may be vulnerable to fraud in the wake of the data breach, with anecdotal evidence suggesting the scams have already started. Luckily (if that's the right word for it) for TalkTalk, it turns out that the number affected was significantly lower than initial reports suggested. For those who are already receiving calls exploiting their information and trying to relieve them of money, though, that's little by way of solace.

Despite initial reports that the attack could be linked to 'cyber-jihadists', the story took a parochially surreal turn with news that a 15-year-old-boy from County Antrim, Northern Ireland (tinyurl.com/MMnet87e), had been arrested and bailed in connection with the attack. Then, just as we were finishing off the column for the week, that strange turn of events was further compounded by the arrest of another teenager in London (tinyurl.com/MMnet87f).

We'd venture that we're a long, long way from getting to the bottom of exactly what's gone on within TalkTalk's systems over the last few weeks, but if MPs have anything to do with it, they're going to find out eventually – having announced plans to launch an enquiry into the whole affair (tinyurl.com/MMnet87g). If it does turn out that a major ISP has been pwned by a couple of lads using an SQL injection that they attempted to mask using a DDoS, its already battered chief executive, Dido Harding, is going to face even louder calls to step down. Rightly so, frankly.

For those who like a bit of tabloid tittle-tattle, we have some 'good' news. It would appear that *The Sun* has decided to step out from behind its Murdoch-approved paywall and back out into the big bad world currently ruled by the *Mail Online* and its so-called 'Sidebar Of Shame' (tinyurl.com/MMnet87h), a questionable feature that has helped it rack up massive visitor numbers while *The Sun* experimented with charging for its content (tinyurl.com/MMnet87i).

Nothing is confirmed yet, but the rumour is that the return of Rebekah Brookes to the paper has heralded the change, which will see the *Mail Online*'s US managing editor move over to its rival in order to take on his former employers (tinyurl.com/MMnet87j). Whether that means *The Times* will be making the same move is unclear, but it's probably unlikely.

In the same week as researchers published what they'd found out about the workings of WhatsApp (tinyurl.com/MMnet87k), including the fact that it collects quite a significant amount of metadata regarding your calls and messages, it was interesting to see the team behind the Tor network launch its own instant messaging app. It hopes the new app, built around the existing Instantbird client, will provide "off the record" (tinyurl.com/MMnet87l) anonymous messaging straight out of the box (tinyurl.com/MMnet87m), avoiding the setup hassles of systems such as Pidgin (tinyurl.com/MMnet87n) and Ricochet (ricochet.im).

Put (probably over-) simply, the Tor messenger setup and its use of the Tor network not only means your messages are encrypted; it also defeats attempts to gather metadata in the same way as browsing with the Tor browser works to obfuscate your activity and location (tinyurl.com/MMnet87o) while browsing. It also simultaneously works to assure the person you're communicating with that you are who you say you are and messages aren't being intercepted or tampered with in any way, and that your message history cannot be trawled through, even if you lose control of your encryption key.

While the Tor team is keen to point out that it doesn't recommend you rely on this app for absolute security while it's in beta, it's certainly an interesting development that could be worth keeping an eye on... if only to see how authorities and other messaging concerns react to its appearance.

While *The Force Awakens* ruled YouTube for a while, Adele's return to music seems to have taken the crown. Indeed, the intrepid investigative bloodhounds of the *Daily Dot* worked out that in the week following its release, we collectively spent 1,300 years watching the video to her new song, *Hello* (tinyurl.com/MMnet87p). But even though it's now topped 150 million views, it's got some way to go to top the 730 million-odd views *Rolling In The Deep* has. We wonder about the world...

.AVWhy?

Videos For Your Eyes...
Not Necessarily For Your Brain

We'd love to tell you that the *Inside Out* cast reacting to the *Star Wars* trailer was the top video of the week (tinyurl.com/MMnet87q), but the fact they'd done it before for *Avengers: Age Of Ultron* kinda spoiled the whole vibe (tinyurl.com/MMnet87r). Thus, we shall revert to a classic internet activity: blowing things up... For that, we hand you over to the The Royal Institution – yes, they of the Christmas lectures – which took to YouTube to "explore the previously unknown interface between thermite and pumpkins" (tinyurl.com/MMnet87s). To late for Halloween, but...



Caption Competition



This strange fellow was the subject of the Caption Competition in issue 1385. Here are your best efforts:

- **PlaneMan:** "Online privacy taken to a new level."
- **doctoryorkie:** "This new Windows 10 stinks!"
- **Lionel Gower:** "On hearing about VW emissions scam, I decided to protect my-self after someone told me I had a Smoking Systems."
- **EdP:** "I need all the protective gear when using my teenage son's laptop!"
- **Mad Malc:** "What's that? Microsoft has made Windows 10 to appeal to early Linux users, you say? That explains a lot.."
- **JayCee:** "That's not what I meant when I asked 'do you have an Anti virus installed?'"
- **BullStuff:** "When you just cannot disable the webcam."
- **Thomas Turnbull:** "My 3D Sewers of London Tour simulator has some drawbacks."
- **John Ross Peel:** "The MM review team were forced to devise some new benchmarks when the first VW laptop hit the bench."

Thanks for those entries, but this week's top-of-the-pops was Wyliecoyoteuk with "The new version of Bioshock comes with a special VR headset". Nice work Wylie!

To enter this week, head to the 'Other Stuff' section of our forum (forum.micromart.co.uk), or email us your funnies via caption@micromart.co.uk, remembering to add the issue number to the email subject line. Cheers!



Music Research Engine Released

Watch YouTube while reading about it on Wikipedia

A new web app has been launched letting users browse and watch music-related YouTube videos while also reading all about it on Wikipedia.

Music Research Engine is the brainchild of the Director of the Stars & Catz Music Teacher Network, and it exists to help students to better research the

context and history of what they're studying. The Engine is part of a free suite of music tools, resources and downloads available on the company website – www.starsandcatz.co.uk – and it's useful in that you have all the relevant information and videos all on the same page.

Bet this is music to students' ears, eh? No? Oh, forget it.

Jolt App Aids With Insurance Claims

Collects car collision data

Here's something a bit different: The Jolt My Car app, which gathers real-time data on a car accident, in theory allowing insurance partners to see who is at fault.

The idea behind the app is that it reduces insurance fraud, speeds up insurance claims and reduces frustration among drivers. The app uses various algorithms and bespoke software

to then also turn that data into a format that's auto-populated into an insurance claim form.

This app can be downloaded now for free to any smartphone and you'll want to mount the smartphone onto the windscreen for it to gather the data you'll need in the event of any claim. It's been tested with the help of the Cumbria Constabulary so it has some credibility behind it too.



Snippets!

Tesla Self-Drive Detour

Some videos have been posted online showing that Tesla's autopilot mode for its Model S electric car is in beta for a reason. Among other things they show cars swerving towards other vehicles and even receiving a speeding ticket. The company has responded – quite rightly, really – by stating that it's not designed to allow the driver to just give up his side of the driving relationship, although the autopilot function is supposed to take over steering and lane changing. What's more, Tesla's technology is meant for the motorway only, whereas the videos show it in action on other roads. That also gives the company some breathing room – as does the fact that it's still basically in test mode for now.

NFL Stream Success

During October, an NFL game came to Wembley Stadium. It wasn't aired on TV, though. No, this one was an exclusively web affair as Yahoo! streamed what was the first ever online-only NFL match-up. The airing managed to attract over 15.2 million unique viewers and 33.6 million total views with a third of those watching from outside of the United States. Yahoo reportedly paid at least \$10m for the rights to air the game exclusively, but we imagine its advertising deals more than paid that off.

Student's Crypto Cash-in

An 11-year-old from New York, Mira Modi, has been covered in the press lately for starting her own small business, **dicewarepasswords.com**.

The business generates passwords by hand, specifically by rolling six-sided dice to bring up completely random numbers that are then matched to a list of English words. Combine those words into a string and you have yourself a long, hard-to-crack password that's nice and secure. So, to be clear, Modi physically rolls the dice, then physically writes the password onto paper, before physically posting it on to the user – all for \$2.

Brits Think Web Is Scary Place

Not a huge surprise

Finishing off our batch of web security-related stories this week is this slice of research coming out of **BroadbandGenie.co.uk**. The broadband comparison site has revealed that most Brits think that the Internet is getting more dangerous, which is a pretty obvious conclusion given the world we're currently living in, right?

Over half of those asked say that they've caught a computer virus at some point, 15%

have had their personal data exposed by a leak or hack and 12% have been a victim of an online scam. Most users (80%) have installed anti-virus software as protection, but just 53% have installed anti-spyware/malware software.

Three quarters of those surveyed also said that companies aren't doing enough to secure their data and over 40% said that they wouldn't use a service again if private information was exposed. Could that be the case with TalkTalk?

Apple Slapped With Class Action Suit Over Wi-fi Assist

Default setting leads to lawsuit in California

Apple's WiFi Assist feature has proven a thorny issue for several Apple lovers as the tool – which allows mobile data coverage to kick in when wi-fi signals might be underperforming – is on by default for iOS 9 users. The problem with this, of course, is that people have been racking up mobile data bills unknowingly, while they innocently thought that they were using wi-fi.

According to Apple news blog *AppleInsider*, a couple of plaintiffs have launched a class-action lawsuit that says the firm should reimburse any

customers affected by the issue. As the feature is enabled on all iOS 9 devices, the potential damages being claimed for is, it's said, going to exceed \$5m.

The fact that this feature is turned on by default has proven a bone of contention for many. According to the lawsuit, the plaintiffs claim that Apple has not done enough to warn users of the possible implications of incurring big data charges for going over their agreed data limits, despite Apple having updated its information on how WiFi Assist works.

BlackBerry PRIV Now On Pre-Order

First Android effort in bid to turn the tide

BlackBerry fans in the UK can rejoice as the company's PRIV smartphone, the first Android-powered handset to come from the firm, can now be pre-ordered. This means going to either Carphone Warehouse for a carrier deal, or paying for the device outright by heading direct for the company's online store – at shop.blackberry.com.

BlackBerry will have pinned a few hopes on this new model being a success, and helping it to catch up with Apple, Samsung *et al.* As such, the PRIV, has a 5.4" dual curved screen with both touch and physical keyboards and a keen focus on security. It looks pretty decent to us, and online chatter surrounding it sounds pretty positive too.



Disney Competes With Streaming IPTV Services

Disney Life will air films, TV and music in one-third

Disney's output is already a feature on streaming services in the UK but this isn't stopping the House of Mouse from launching its own rival subscription service.

Disney Life, for 'tis its name, will air its films and TV content while music and

books will also be included from within the one app, obviously pitched against Netflix and Amazon Prime Video. The service will cost £10 a month, which is actually quite pricey in comparison.

Will pester power lead to people signing up to this, and will it have any impact on its content deals elsewhere?

Employees Review Rock Band 4

Harmonix says sorry over five-star posts

Amazon's user reviews of games are always a tricky thing to negotiate, depending on how much credence you give to these things, but when employees involved in the game itself are dishing out those reviews, that's hardly a ringing endorsement.

Developer Harmonix has been forced to admit that some of the positive five-star reviews for its *Rock Band 4* title are actually from its own employees, ones that worked on the game no less. The practice was uncovered by Reddit users and then picked up by a few sites online.

Harmonix has apologised, of course, in a statement to games blog Destructoid, saying that while it felt employees were posting honestly, their actions weren't really appropriate.

The thing is, community backlashes are not the kind of publicity you really want for any new title, although we're sure dedicated fans will snap this up.



BT Blazes 5Gb/s

G, that's fast!

BT is particularly pleased to tell the world that it's achieved speeds of up to 5Gb/s over copper broadband, all thanks to an advancement on its G.fast broadband technology.

XG.FAST has achieved the speeds in experimental lab trials conducted by BT and Alcatel Lucent, delivering aggregate speeds of 5.6Gb/s over 35 metres of BT cable – that's a record for full-duplex data transmission over a standard single BT line at that distance. It also did pretty well over a longer

distance, achieving aggregate speeds of 1.8Gb/s over 100m – significant, as many UK homes are within this distance of their local distribution point.

G.fast, then, could be future-proof, according to BT, and could be crucial in driving the UK's digital economy, with BT still sticking to its plans to deliver ultrafast speeds to ten million premises by the end of 2020.



REVIEWS

Magix Movie Edit Pro 2016 Premium

Edit like a professional with Magix Movie Edit Pro 2016

DETAILS

- Price: Movie Edit Pro 2016, £ 49.99, Movie Edit Pro Plus 2016 £ 69.99, Movie Edit Pro Premium 2016 £89.99
- Manufacturer: Magix
- Website: www.magix.com/uk
- Requirements: Dual-core 2.4GHz CPU, 2GB RAM, 2GB disk space, Microsoft Windows 7 or later



▲ Fully featured and easy to use



▲ It comes with full audio authoring and a comprehensive range of music

The procedures and sophistication of modern video editors, together with the speed that our PC systems are now capable of, means that video editing is not such a chore as it used to be.

Whereas professional editing was originally carried out on very expensive editing suites costing thousands of pounds, today you can get pretty close with a single PC and a software editor, like this latest release from Magix.

The Movie Edit Pro series has been around for many years, with regular updates providing ongoing development, so keeping the programs in line with current technologies. There are three versions of Movie Edit Pro, but this review is based on the Premium package, which in my mind still represents the best value, particularly as the price has been reduced by £10, yet Magix has updated the whole system and included a lot more content. For example, the package includes the NewBlue Action Cam Package, a product designed for users of GoPro or similar cameras. Incidentally, the effects and adjustments it provides are not just for action footage, because it includes

things like auto contrast, tint, colour shift and more. This version is also the first program to support 360° editing, for video taken with panoramic cameras. It's not that long ago that the price of these cameras would have limited this option to those with deep pockets, but the price is now well within the bounds of us poor folk, and I have to say panoramic video is nothing short of spectacular.

Another product included with this package is proDAD Mercalli 4, which, as it happens, would also be useful for the action camera buffs. It does an amazing job of correcting those handheld shots, with sophisticated image stabilisation and CMOS correction. This is when the image sensor inside your camera has not coped with

the bumps and shakes generally found in actions shots, which results in the introduction of even more distortion, as the sensor tries to correct the problem. However, Mercalli is one of very few products that can automatically correct both shake and CMOS distortions.

With the addition of the NewBlue EX Titler, Magix maintains that the extras in Movie Edit Pro Premium are worth twice what it charges for the program. And to be fair, the titler can create the most amazing and professional-looking titles, complete with animations, special effects, transitions and more. It's also fairly intuitive to use. Most of the options are simply drag and drop, or you can see a preview by hovering over each icon.

Yet what makes Movie Edit Pro Premium stand out from other video editors is the comprehensive range of templates that Magix provides. These come in different styles and lengths, with music and transitions to match; all you have to do is drop in the video content. A single click will accept the layout and drop you back to the standard timeline, where you can do any fine tuning before outputting to whatever media format you need.

The program can now handle multi-cam editing, which is a lot easier to do than you might think. You simply drop the footage into different tracks, use the context menu to align the audio, and switch to multicam mode. This displays the different camera views and the target view in the preview monitor, then it's simply a matter of running the footage while clicking on the relevant camera view to add it to the video being assembled. It's actually a lot easier to do than describe.

If you do try one of the Edit Pro products, there are free 30-day trial versions on the Magix website. **mm Joe Lavery**

Plenty of new features and yet more content



Philips E-line Monitor (227E6E)

Not True blue but SoftBlue features in this next review

DETAILS

- Price: £189
- Manufacturer: Philips
- Website: www.philips.com/cdmonitors
- Requirements: Windows or Mac

Not everybody has the space or need for one of the larger monitors that are currently available. For those who fall into this category, Philips offers its E-Line 227E6E display. This monitor features SoftBlue LED technology, which has been designed to help combat the problems that can be caused by blue light rays emanating from LED displays. These rays can pass

through the cornea and crystalline lens, causing deterioration to the retina and adversely affecting vision.

While this product's number might indicate that this is a 22" monitor, the panel actually measured 21.5" or (54.6cm). With an aspect ratio of 16:9 and a maximum resolution of 1920 x 1080, this panel is surrounded by a black cherry coloured, reflective bezel and perches, mounted on a short support post, to a circular stand of the same hue. Attaching the panel to the stand is relatively straightforward, as you line up the two elements and then tighten a finger screw in the stand unit.

The fixed nature of the panel and stand doesn't allow for a height or swivel adjustment. The



only adjustment you can make to this setup is a 25° change in the pivot angle. There is, however, a claimed viewing angle of 178° both horizontally and vertically as you view the available 16.7 million colours.

Connections on the rear of the monitor allow you to attach the supplied two-piece power lead using either two- or three-pin plugs and link the monitor to a computer via a VGA, DVI or HDMI lead. My review sample came with a VGA lead. There's also a connection for HDMI audio output if needed. A small cable management collar device is provided to help keep attached leads under some sort of control.

Philips provides a choice of methods for adjusting the monitor's various settings. There's the standard OSD method available via extremely sensitive touch buttons located on the right side of the lower bezel. While I appreciated the SmartImage Lite feature, whereby you could quickly switch between Standard, Internet and Game modes with appropriate settings that formed part of the OSD controls, I much preferred using the second method of adjusting settings provided by Philips.

This is the bundled SmartControl Lite utility, which is included as part of the software CD. SmartControl Lite splits its functionality into areas that have been designated as Adjust, Colour and Options. Based mainly on slider bar controls, you can make alterations to various features such as brightness, contrast, resolution, calibration, RGB, input type and even select from a choice of screen layouts for multiple views on a split screen. Overall, I found this a more friendly method of making adjustments.

mm Michael Fereday

A monitor suitable for those with limited desk space



Philips SoftBlue Monitor	
Picture / Display	
Monitor Panel Type	IPS-ADS-LCD
Backlight	LED
Panel Size	21.5" / 54.6cm
Aspect Ratio	16:9
Pixel Pitch	0.248 x 0.24mm
Brightness	250cd/m ²
SmartContrast	20,000,000:1
Typical Contrast Ratio	1000:1
Typical Response Time	14ms
SmartResponse	5ms
Optimum Resolution	1920 x 1080 @ 60Hz
Viewing Angle	178° (H) / 178° (V) @ C/R > 10
Picture Enhancement	SmartImage Lite
Display Colours	16.7M
Vertical Refresh Rate	56Hz – 75Hz
Horizontal Frequency	30kHz – 83kHz
MHL	1080p @ 30Hz
RGB	YES
Dimensions / Weight	
With Stand (W x H x D)	511 x 400 x 212mm
Weight with Stand	295g
Connectivity	
Signal Input	VGA, DVI, HDMI
Audio In/Out	HDMI audio out

Seagate Personal Cloud 2-Bay 4TB

Seagate makes a NAS box for those who don't live and breathe computers

DETAILS

- Price: £224.41 (Dabs.com)
- Manufacturer: Seagate
- Website: www.seagate.com
- Requirements: Wired network, broadband router

Not everyone wants total control when it comes to personal storage. Many people want a plug-and-play solution with the technical aspect, and the Seagate Personal Cloud is built just for them.

Seagate makes the Personal Cloud in single- or dual-drive enclosures in a range of capacities, and here I'll be looking at the 4TB (2x 2TB) model. In many ways, this is the successor to the Seagate Central that arrived two years ago, although it's obvious that Seagate has learned plenty from that, which it chose not to repeat here.

The first obvious difference is that the box can be opened by the user, allowing them not only to replace a failed drive but also potentially upgrade it. Inside this one were two 2TB Seagate NAS drives, which can either be combined into 4TB of unprotected storage or 2TB of redundant space for your digital stuff. Further expansion can be added to the device

via the two USB ports, although only one is USB 3.0 specification.

What this shares with the Central series is the simple but effective web interface that boils the whole NAS experience down to some basic information and controls. Because the push here is a 'Personal Cloud', all users are required to provide an email address, which is then used to send them confirmations and also provide a means to bind the

services to external devices like phones, tablets and PCs.

The first user is effectively the administrator, who can invite others to the party, and access is provided on both a public folder structure and private one specific to the user.

How straightforward this all sounds seemed great, until I started to play with some of the extensive data backup features that the unit includes. Although any user can secure his personal space and the public area, there's

no user empowered to do the same for the private areas of others or the system as a whole. By definition, each user must establish their own backup routine, even if they're going to use the same USB-connected drive, network locations or cloud storage to do that. The admin user should be able to do that job, even if he can't access the private files.

Where Seagate does better is in respect of supporting existing cloud technology.



Using the web interface, it's possible to back up a folder to Amazon S3, Baidu, Box, Dropbox, Google Drive, Strato HiDrive and Yandex Disk. And you can sync in either direction with Dropbox and Google Drive.

The only reservation I have about these facilities is that they're all timed operations with a minimum cycle time of an hour, so they're not 'live' connections.

What works better is the SDrive software functionality,

the 'Personal Cloud' part of this device. Using an app on PC and Mac allows a folder in the Personal Cloud to be bolted into computer as a regular drive, but accessible globally.

My problem with SDrive is that if you're on the same physical network as the Personal Cloud, it still insists on sending your data via the internet. I know this because the speed of writing to the drive was about 4.5MB/s, whereas sending the file over a network share managed to be 12 times faster.

That said, it works, and it allows you to get to your files from anywhere. For phones and tablets, there's the Seagate Media app, which allows you to look at videos and images and listen to music. Since I tried this last, the mobile app has got quicker but is still designed for very limited media collections, unfortunately.

Probably the biggest disappointment is how the app store has failed to evolve in any significant way in two years. There are only seven apps to install over five app categories, with 'Security' and 'Utilities' categories having no apps at all.

Probably the most useful thing on here is BitTorrent Sync, if you use that tool to move data around the internet without using the cloud. However, using it made the interface unresponsive, as the workload stressed the CPU.

I'm inclined to believe that Seagate is learning lessons, although it seems slow to put some of that expertise into these devices. Cloud is 'live', not hourly or daily synced,

Read [MB/s]		Write [MB/s]	
Seq Q1T1	73.99	Seq Q1T1	63.25
4K Q1T1	2.594	4K Q1T1	8.562
Seq Q3T1	89.13	Seq Q3T1	66.17
4K Q3T1	2.859	4K Q3T1	6.876

and its platform needs better consumption tools and more feature-adding apps.

The schism here is between making this something the non-technical can deploy, and more desirable to those who are computer literate and want to exploit what is a useful piece of kit. At the moment, it's failing both ends of that range in different ways, although it's an improvement in many ways over the Central.

For this to complete with the likes of QNAP and Synology, it needs extra processing grunt and apps to exploit that additional power.

mm Mark Pickavance

A NAS box that's simple to deploy and use



“ Probably the most useful thing on here is BitTorrent Sync ”



Photo Commander 12

Sort out those folders full of images with Ashampoo's Photo Commander 12

DETAILS

- Price: £ 39.99
- Manufacturer: Ashampoo
- Website: www.ashampoo.com/uk
- Requirements: Windows XP or later, 256MB RAM, 250MB disk space

If you're an avid snapper like me, then I'm sure you also have folders full of unedited and in the main unorganised images that you're going to sort out 'some day'. The trouble is that day never comes, unless you can find a utility that will take some of the strain out of doing the job for you. After a quick look at Ashampoo's latest release, Photo Commander 12, it seems I might have found a likely candidate.

Photo Commander is a multi-faceted program, designed to handle most of the problems involved when trying to sort, catalogue and, to some degree, rectify any compositional errors found in your images. On top of that, it can help to make more creative use of them once they've been sorted, which apparently is another area where we all fail miserably; it seems that most of the images we take end up confined and forgotten in some obscure backup folder.

Although multi-faceted, the program is not overly complicated; in fact, if I can manage to find my way around it without resorting to the help file, most users should be okay too. The interface is laid out quite logically, with a directory tree to the left, an adjustable thumbnail view in the centre and a preview of the current



▲ Just a few of the effects you can apply



▲ Sorting and tagging your files is quite straightforward

image on the right. This view is primarily where you would sort out your images, add various tags to rate each image, give them a title or create albums. The idea is to make it easier to find specific files or group them into more logical sets. If this is too time consuming for you, the calendar option will sort them into date order at the click of a button. I also liked the idea of bookmarks in the folder tree, which makes it much easier to navigate, without constantly clicking through dozens of folders to get back to the files you're working on.

The developer has obviously thought about how a typical user might work, because it's cross referenced the same options on different pages. For

example, when you're using the Create menu, the Frame option takes you to the object menu, where you can select the appropriate frame.

Double-clicking on a thumbnail in the will open the quick fix screen, where you can make all sorts of adjustments or apply special effects. These include things like crop, optimise, change perspective, remove blemishes, correct horizontal alignment or apply one of the preset effects – and believe me, there are plenty to choose from.

I should also mention here that the optimise option is not a one-shot affair either; it's broken down into separate elements, giving you much greater control over the result. For example, there are three

levels you can apply to remove noise artefacts from an image. If you prefer to make these adjustments manually, the contrast/colour option opens a new screen with the full array of controls. These include colour strength, temperature, hue, saturation and more. There's even a full histogram and a graduation curve where you can manually adjust the density for each of the colour components. You can save these adjustments, which is particularly useful if you have a number of images with similar faults.

Finally, the create menu has options to make something more of your images than simply printing them. You can create calendars, greetings cards, panoramas and slideshows, both as a conventional video file that you might burn to a CD or as a HTML file that you could upload to a website. If you do simply want to print your images, Photo Commander has that covered too. Yet here again there are options to add multiple images on a single page, create a contact sheet or build a collage.

mm Joe Lavery

A genuinely useful utility



Speedlink Strike NX

Can this budget gamepad compete with more expensive alternatives?

DETAILS

- Price: £12.30 from eclipsecomputers.com
- Manufacturer: Speedlink
- Website: www.speedlink.com
- Requirements: USB port

Some time ago, I reviewed the Speedlink Torid gamepad, a wireless controller bearing more than a passing resemblance to the official Xbox 360 pad. As well as dual support for Xinput and DirectInput, and compatibility with the PlayStation 3, the Torid is comfortable to use and feels comfortably robust. Currently, available for around £20, it's also a bargain.

But what if you don't like the Xbox-style shape? Perhaps you'd prefer to have the left analogue stick in the middle of the controller, a la PS3? And what if you think that 20 quid is too much? Well, if any of these factors apply to you, then the Speedlink Strike NX might be more up your street.

This more budget conscious controller can be bought for as little as £12, yet it offers much of the functionality of its more expensive stablemate. Chief among those are wireless connectivity, vibration, the same number of buttons and, of course, support for Xinput and DirectInput. As you might already know, that means it can function like an official Xbox controller or as a standard PC gamepad, which gives you a greater chance of compatibility with certain games.

Of course, there are differences, and some of them reveal why it's cheaper than the



Torid. Immediately, you can see that the layout is more similar to the PlayStation controller than the Xbox one, but while the Torid boasts full PS3 compatibility, the Strike NX does not, because it lacks the 'PS' button that brings up certain menus in that console. However, like most PC gamepads, all the other buttons should work with the PS3 (bear in mind, though, it charges via micro-USB rather than the mini-USB that PS3 controllers use).

You'll also notice, looking at the Strike NX, that it has a kind of Batarang shape to it, ending in two points at the bottom. What's not so obvious is that there's no rubber padding here like there is on the Torid, so you're handling cold, hard plastic, which is a little uncomfortable and could be a problem for extended gaming sessions.

Another thing that gives away the budget nature of this product is the USB dongle that provides

the wireless connection to your PC. Unlike the tiny nano receiver that comes with the Torid, the Strike NX has a dongle that measures nearly two inches, which naturally makes it more vulnerable to breakage.

However, the biggest crime that the Strike NX commits concerns its trigger buttons (L2 and R2). Rather than have a satisfying gliding motion to them, they feel spongy and cheap. Were it not for these, this controller would be a steal at this price, because the analogue sticks are decent, the D-pad is comfortable to use, and the rest of the buttons feel okay too. But the triggers are hugely important in many games, so any controller worth its salt will get these right. Obviously, Speedlink had to make some cuts in quality to bring the price down so low, but it's still a shame, because it spoils an otherwise well-made product.

Nevertheless, it's impressive what you get here, considering the price, but unless there's some reason why you can't get an official Xbox 360 controller or, indeed, the Speedlink Torid, then you're better off spending a bit more.

mm Anthony Enticknap

A great price, but the triggers just aren't good enough



HP Deskjet 3630

HP brings the Deskjet brand to a new generation of personal printers

DETAILS

- Price: £49
- Manufacturer: HP
- Website: www.hp.com/
- Requirements: Windows Vista or later, Mac OS X v10.8 or later



I first used the Deskjet Plus in 1989, and 26 years later, we're not a long way from that original highly successful concept. HP's new Deskjet 3630 is still built around a combined ink head and reservoir in the cartridge, and produces reasonably rapid output on a good range of stock. And in this variation, it also comes with a scanner to add extra scan and copy functionality to the standard printing skills.

Seeing this printer after covering HP's Envy 4520 printer was most enlightening, because they're effectively built around the same print engine, but the designers took rather different paths. While the Envy was low, angular and wide, the Deskjet 3630 is taller, takes up less desk space and has a decidedly curved aesthetic. It's also a creamy white, making this seem much more like something you'd put in a home than an office.

But the biggest change is that there isn't a paper tray on this design; instead HP opted for a rear-angled feed, and this isn't as elegant.

I had some problems with it, because the feed failed to cleanly pull individual 15 x 10cm sheets of gloss from ten sheets I put in. And it has auto paper detection that wrongly identified A4 as Letter sized.



Oddly, the one area where I thought I'd have problems, wi-fi, worked flawlessly. As there isn't a big enough LCD for inputs, to connect the Deskjet 3630 to your wireless network needs you to initially use USB or WPS. I used the latter, and it worked really well and very quickly, and once visible on the network, the drivers automatically installed.

The LCD panel is postage stamp sized and gives you the number of copies you've selected, wi-fi signal strength (if wi-fi Direct is in use), ink levels and it reports any errors. As the LCD is mono, it assumes you know which of the two ink level relates to

colour and black, though I'd just assume the lower one is more likely to be colour.

Ink comes in the same HP 302 cartridges as the Envy 4520 uses, and sadly that means all the colours are in one cartridge and black in the other.

The standard-sized HP 302 tri-colour cartridge is rated for 165 pages at 5% coverage, which I found translated into just six A4 borderless prints before it was exhausted. To replace this cart costs £13 from HP, and the black is £10.99. HP does make 'High Yield' XL versions of the colour and black costing £22, which are rated to 330 pages and 480 pages respectively.

If this sounds expensive, and it is, HP has included this printer in its new 'Instant Ink' service option, where you pay from £1.99 a month to have HP send you cartridges automatically when the levels reach a critical point. This will save you money over direct purchasing. However, given how rapidly they can empty, I'm not sure how you'd be protected from running out in practical terms.

Overall, unless you buy printers for their looks, I think this isn't as good as the Envy 5420, which brings you a slicker experience for just a tenner more.

mm Mark Pickavance

A very basic printer, scanner and copier for home use



Western Digital My Passport X 2TB

Game console owners get a My Passport specifically for them

DETAILS

- Price: £95.99 (WD Store)
- Manufacturer: Western Digital
- Website: wdc.com
- Requirements: PC or Xbox console



Since it launched them Western Digital has done a roaring trade with its My Passport product range. Starting first with USB 2.0, we've since seen a move to USB 3.0 and even Thunderbolt connections.

The current range includes the small, cheap and cheerful at one end and the modestly larger premium products at the other.

The new My Passport X is a slight diversion, being a drive that's been pitched directly to game console owners – specifically those who bought into the Xbox One and who have rapidly found out that the default 500GB of space doesn't

go far once your game stable starts to grow.

According to Western Digital's maths, the 2TB My Passport X will hold about an additional 50 games, though frankly it might be more or less, because games aren't a set size.

Using an external drive with the Xbox One is relatively straightforward. You plug it into a USB port, the system formats it for Xbox use, and then you can install and play titles from it.

Microsoft has launched a 1TB version of the console, but that's of limited appeal to those who already own one. So this is probably the way to go, should you run low on storage.

What you can't do is use this on both a PC and the Xbox One, because once it's reformatted for one, it's no use to the other, sadly. Well, you could reformat it again, if your Xbox One dies, I guess.

While you've been reading this, I'd guess you've been wondering what specifically about this drive is tailored to the console, right? I had exactly the same thought, and as far as I can ascertain, there is nothing about this external drive, other than the fake carbon fibre look that is specific to using it with any console.

Indeed, if you check out what the compliance standards for external drives are on the Xbox One, they're rather general. So flexible, in fact, that almost any USB 3.0 external drive you could buy would be considered sufficiently compliant to work.

But surely the My Passport X is 'performance-tweaked to meet the desires of serious gamer'? Yes, I'm sure it is in some way, but as a PC drive, it isn't actually as quick as the current My

Passport Ultra range. This reads and writes at about 105MB/s, and a My Passport Ultra does the same at 115MB/s.

And that's a bit of a sticky problem, because where the 2TB Ultra is £75, this one is £95.99 at the WD Store, and you can get the lovely My Passport Ultra Metal Edition 2TB for just another £4 more.

So while the My Passport X succeeds in expanding the Xbox One capacity and on styling continuity, it fails rather badly at being good value for money.

If I owned an Xbox One, I'd just get a 2TB Ultra in black, and put the difference towards a new title to start loading it up.

mm Mark Pickavance

More space for your Xbox One can be had cheaper



GROUP TEST

Android Universal Remote Apps

Who would have thought that one day we'd be able to control nearly every item of technology from our phones, let alone have a choice of apps to pick from?

This week we look at six Android universal remotes, each with a slightly different level of support, look and feel, to see which are worth installing on your phone – or not.

Android Universal Remote Apps

Peel Smart Remote

DETAILS

- Price: Free
- Manufacturer: Peel Technologies Inc
- Website: goo.gl/NRV9H4
- Requirements: IR enabled phone Android 4+, Google account

The Peel Smart Remote app has been around for just over a year now and has seen quite a few updates during its time, with the most recent version being 8.5.0.

Essentially, this app allows you to use your phone or tablet as a remote for your TV, satellite receiver, DVD player, Blu-ray player, Roku, Apple TV and other home automation devices – basically, anything that's considered 'smart' by today's standards and capable of receiving data from the IR sensor on an Android device.

However, herein lies one of the problems with Peel, in that to get the best from it your device

needs an IR blaster. Most of the newer Samsung and HTC devices have one, but there's a good chance you may miss out due to having an older or not as feature-laden phone.

That said, Peel Smart Remote is extremely easy to set up and use. There's a basic guide that walks you through the process of pairing your device with a TV, Blu-ray player and so on. You'll need to confirm your location first, from a choice of over 100 different countries available (so at least you could use it on holiday), but after that it works well enough.

Among the other features are a personalisation setup, which is in basic terms a kind of favourites area, where you'll store your most watched channels and programs. This makes getting to the right content far easier than when using a traditional remote control or having to trawl through the various apps pre-loaded into a smart TV.

Aside from taking your viewing tastes into account, Peel lets you discover other content from a variety of sources, such as Netflix and the like, through a selection



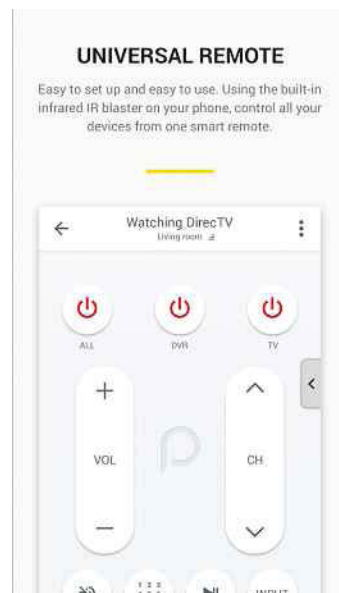
of movie and TV poster styles separated into different categories. These include What's Happening Now, Tonight on TV, Popular on Twitter and Popular on YouTube. Tapping one will expand the view and offer details regarding the show or movie. From there you can create an alarm, start recording to your DVR, if you have one and have set it up prior to viewing the content, or you can tap a Watch Now button to instantly take you to the content.

It's a relatively painless app to set up and use, and with a little time spent on the configuration and personalisation, you can end up with a perfectly acceptable remote control. It'll even allow you to label certain paired devices, so you can quickly switch to the living room TV from the bedroom TV.

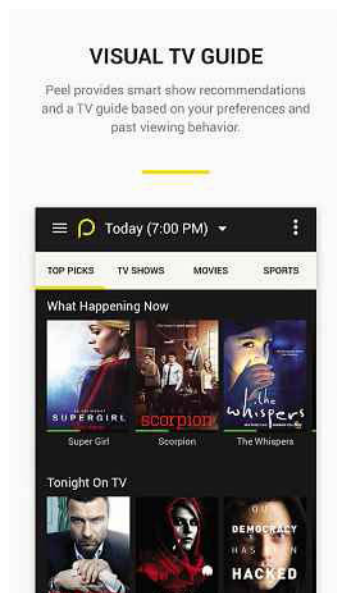
Using our LG TV and Sony Blu-ray drive, Peel Smart Remote worked well enough. There was a little confusion with the pairing with the TV to begin with; we're not sure why, but after cycling the power on the TV and restarting the app, the two started to get along fine.

For the home automation side of things, the Peel did have a little difficulty getting to grips with our Archos Smart Plugs, Mini-Cam and Motion Ball Monitor. When it eventually started to communicate, it worked well, until the device we were using the app on rebooted itself and we lost the connection. Unfortunately (and again we're not sure why), it never reconnected again, despite our best attempts.

Overall, it's a decent app, but you may need to experiment with your kit and spend some time configuring it before it's perfect.



▲ Peel is pretty easy to set up and use



▲ The UI looks good too and is clear enough for continual use

Smart IR Remote – AnyMote

DETAILS

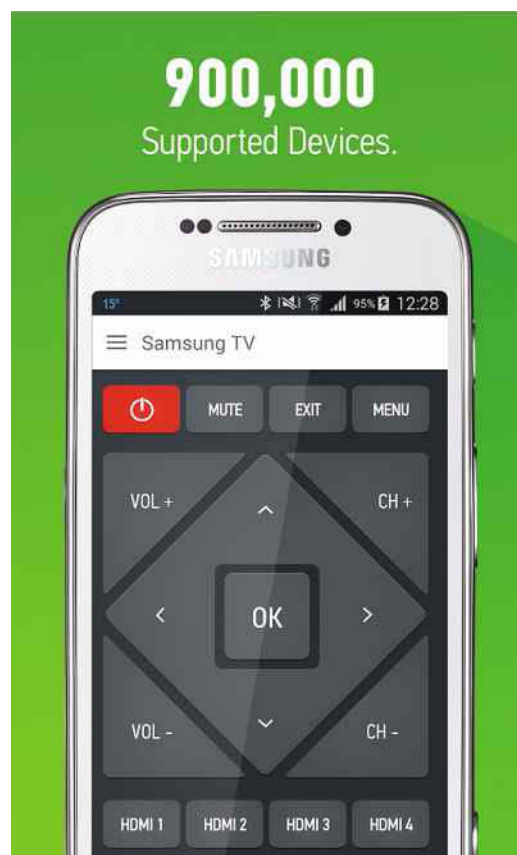
- Price: £5.60
- Manufacturer: Color Tiger
- Website: goo.gl/Q4YWQ2
- Requirements: Android 4.0.3+, IR enabled device, Google account

Color Tiger's AnyMote was one of the first IR remotes available for Android. This California start-up did great things with the AnyMote app, including launching a successful Kickstarter campaign for a conical-shaped hardware accessory. But has it done enough recently to remain in the top list of remote control apps?

Now on version 3.4.0, Smart IR Remote Anymote boasts coverage of more than 900,000 Android devices and can easily connect to and control a wealth of TVs, cable and satellite boxes, DVD and Blu-ray players and home automation devices.

However, that claim does come with a few problems. For one, this device isn't compatible with Huawei, Vizio or Sony phones and tablets. Nor will it work with anything from LG, and there are reported problems with some Samsung phones and tablets too, as well as some compatibility problems with Android 5.1.1.

Sadly, this is the Android version number we were using for testing, and while the app did install, it failed to connect to our TV or any of the set-top boxes. It did, however, work with the Archos kit we were testing with and managed to power on the few lamps and the radio we had plugged into



▲ With so many things supported, you'd think ours would work

the Smart Plugs, as well as interacting with the Mini-Cam. However, it has to be said that the communication between the app and these devices was exceedingly slow, at least compared to the other apps on test.

That said, and despite the fact that we couldn't get it communicating with our living room technology, it does appear to have a lot of handy features. There's the ability to mute or pause what you're watching when a phone call comes through on the phone, you can set up automated tasks and macros that allow you to control or power up multiple devices with a single tap command, and you can set up various widgets to help you get access to your favourite commands and controls.



▲ Despite its failures, it does look quite good

It also comes with a selection of gestures that enable you to easily control the volume, pause, change channels and change TV inputs. And there are several configurable modes to set up too, such as a Party Mode, which will instantly power up your music system, lights and play a selection of tracks. Similarly, you can set other modes, to power down the lights and turn the volume low, for example.

It's a great pity that Smart IR Remote – AnyMote didn't work on our device with the living room kit we have available, because we think it may have been a good contender for one of the top slots of the group. Considering the app costs £5.60, it's really not worth attempting to test

on your device, unless you specifically know in advance that it'll work with your device and the kit you own.

Although a good sounding app, it's one we can't really rate too highly, due to its incompatibility and cost.



Android Universal Remote Apps

Unified Remote

DETAILS

- Price: 75 pence
- Manufacturer: Unified Intents
- Website: goo.gl/Q64oUg
- Requirements: Android 2.3+, IR enabled phone, Google account

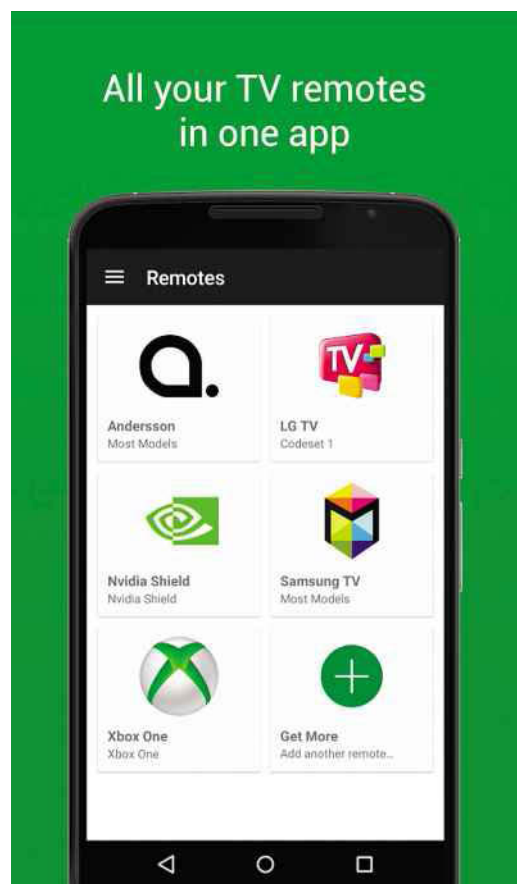
Unified Remote started life in 2010, when a pair of Swedish students started to play around with the idea of an Android remote as part of a hobby.

Now on version 3.5.0, the app has well over five million downloads to its name and has since included a remote option for a PC or Mac, including support for Windows and Linux.

The idea is simple enough: Unified Remote allows you to connect to and control all of the programs you have installed on your computer. There are dedicated remote options for individual programs such as VLC, Spotify, Windows Media Player, iTunes and so on, and you can control streaming media from the likes of YouTube, Netflix and Hulu.

As you may well notice, though, the free version isn't a remote for physical living room technology, so don't expect to control your sound system with it. However, if you have a Windows or Linux media centre in place or even a Mac one, then you can easily take control of the entire system through the server and client/app based Unified Remote.

With the server software installed, along with the app on your phone or tablet, you're able to control the keyboard, mouse, and volume, and you can even power off or hibernate your PC. As we said, there are



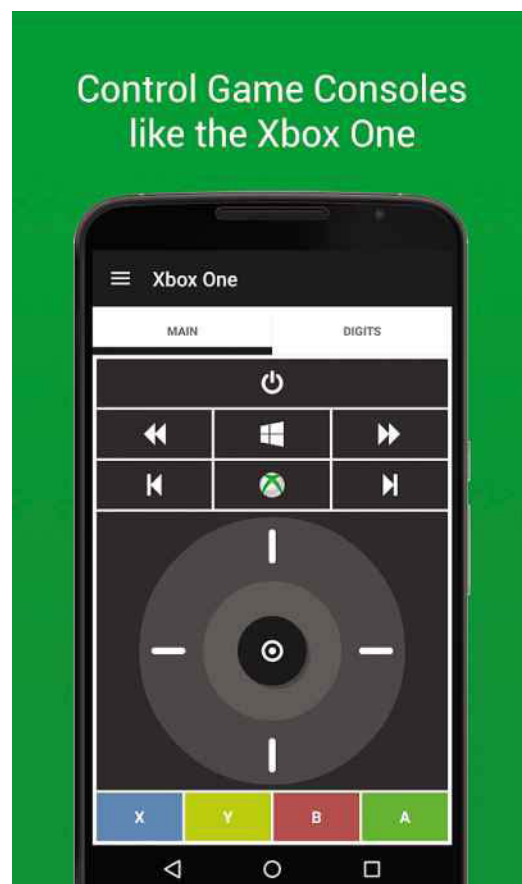
▲ The paid-for Unified Remote only costs 75p, but allows so much more

individual remote templates for a variety of different programs, but you can also opt to take control of other networked devices, such as a Raspberry Pi or Arduino. Essentially, then, if you've set up a home automation system based on those control boards, then you can use Unified Remote to control how they work.

The free version has some adverts, but they're not too intrusive, and it has a brief selection of the aforementioned program templates. Upgrading to the full version, which only costs 75 pence, gives you access to a considerable number of upgrades and, more importantly, it allows you to control your living room technology.

With the full version installed, we managed to connect to all our test equipment and have it working flawlessly. There are also a lot of unlocked remotes for installed programs, which cover browsers, office programs and Kodi, and you can create your own custom remotes.

The full version gets rid of the adverts too, and you can view the output to your TV from your phone or tablet. Plus you can send any extended keyboard commands to your PC using the Alt and Ctrl keys. And finally, there's also a voice command control added to the full version, so you can launch programs by simply saying 'Spotify' or



▲ You can even control a games console

whatever, along with 'play', 'shutdown' and the like.

The free version of Unified Remote works very well indeed and is certainly functional and handy for a media centre PC. But the 75 pence for the paid version extends the support and usability of the app well beyond some of the other apps here.



IR Universal Remote 2.0

DETAILS

- Price: Free
- Manufacturer: WaveSpark
- Website: goo.gl/dqsEDV
- Requirements: Android 4.4+, IR enabled phone, Google account

The recently released IR Universal Remote 2.0 has built on the previous IR Universal Remote by adding some new and tantalising features. Now on version 11.010, this app includes a remote control for your PC, various theme updates, improved stability and the ability to import your previous saved remote setting to the new framework.

There are various preset and common remotes for a number of TVs and other equipment, which connect quickly and work well enough. The LG TV we were testing with worked after a moment or two of communications between the phone and the app. After that, it allowed us full control of the TV and was remarkably quick when selecting the various TV functions – better than the supplied LG remote, we thought.

Other features include a vibration feedback for various buttons, personalisation of the remote templates, widgets to get better access to the most used functions and the ability to download custom remotes from the IR Universal server.

The app worked okay on the Blu-ray player and the Minix media centre PC we were testing with. But it never managed to connect properly to the Archos home automation kit we were



500,000+ IR CODES

▲ IR 2.0 works, but it's an ugly-looking interface

using. It did indicate a proper connection, but the app refused to send any signals to the plugs or the camera. Whether this was a problem with the Archos kit or the app itself, we're not sure, but the pair of them never worked.

The media centre connection to a PC worked well, though, and we were able to control the mouse, keyboard and XBMC without too much trouble. Once the Windows companion application from WaveSpark.org is installed, all you need to do is enter the IP address and you can start using the mouse and keyboard.

The main problem we have with IR Universal Remote

2.0 is the lack of any decent user guides or extra features. True, the app connects to the equipment, but it's a pretty bland-looking interface. and there's little beyond the control function other than a voice command feature for the remote PC element. There are also adverts that take up the full screen from time to time, and although the app home page states you can remove the apps by upgrading to the full version, we couldn't find any way of doing this.

There's an impression that the app isn't quite finished or that the developer got bored of the project halfway through and decided to



NEW - CONTROL YOUR PC!

▲ It also feels a little unfinished, as well as unpolished

simply upload it to the Play store as is.

It's a good enough and working universal remote app, but it's not one that we'd pick as our only Android remote control.



Android Universal Remote Apps

Easy Universal TV Remote

DETAILS

- Price: Free
- Manufacturer: Big Fishes
- Website: goo.gl/Y6BAkj
- Requirements: Android 2.2+, IR enabled phone, Google account

According to this app's developer, Big Fishes, Easy Universal TV Remote was the first app on the Google Play store that allowed you to use your phone or tablet as a universal remote control.

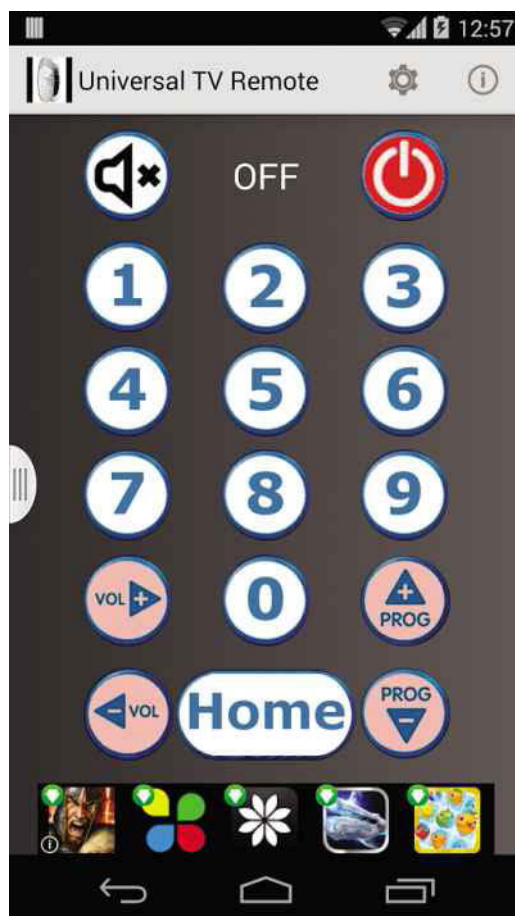
Whether this is true or not, we're not entirely certain, but the app is now on version 2.2 and shows no signs of slowing down. However, there are one or two major problems that need addressing.

The first problem we have is that this app appears to be nothing more than a collection of full-screen, irrelevant adverts. We downloaded and installed it, then ran it, only to be presented with a succession of adverts. After that, we tried to get the app to connect to our living room equipment, only to have another couple of adverts appear mid-configuration.

After at least ten minutes of trying to connect to anything and receiving more advertising time than we've had in the last year, we gave up.

Sadly, the app just didn't want to connect with the LG TV, Blu-ray player, media PC or any of the home automation technology we had for testing.

According to some reports, Easy Universal TV Remote not only fails to connect to what seems like nigh-on every TV in existence, it also fails to work with the vast majority of



▲ A brief moment when adverts weren't full screen

Android phones and tablets too. In short, it appears that Easy Universal TV Remote is pretty useless.

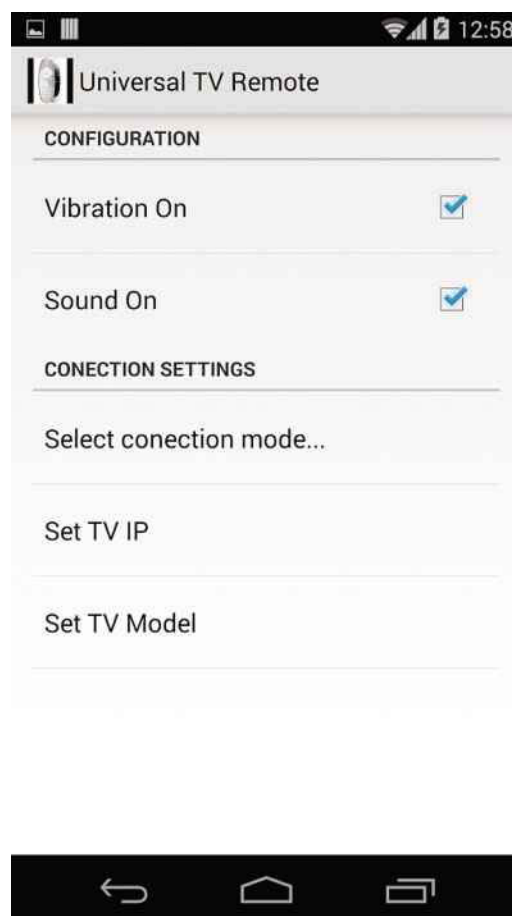
There is one redeeming factor, though: it somehow managed to pick up the IP address of next door's smart TV, which is oddly the same make and model. This proved to us that at least something was going on with the app other than beaming a continuous stream of adverts at us. Incidentally, despite being able to pick up the IP address, it still refused to connect to the neighbour's LG TV.

There's really very little else we can add to this particular review of Easy Universal TV

Remote. It is, by far, one of the worst apps we've ever had the misfortune of installing.

The Paris-based developer of Easy Universal Remote has since launched another version of what appears to be the same app, but this time it's has dropped the Easy part and added a Pro at the end. Needless to say, Universal TV Remote Pro appears to be as poor as its predecessor, based on the majority of the comments in the ratings sections and elsewhere on the internet.

We didn't bother testing the other version of Easy Universal TV Remote, purely because we couldn't stand another round of mind-numbing adverts, but



▲ Easy Universal TV Remote is by far the worst app we've ever used

we'll gladly take other users' ratings on the matter.

In short, we really wouldn't recommend Easy Universal TV Remote to anyone who values their sanity.



Sure Universal Remote

DETAILS

- Price: Free/£2.34
- Manufacturer: Tekoia Ltd
- Website: goo.gl/fo2x10
- Requirements: Android 4.2+, IR enabled phone, Google account

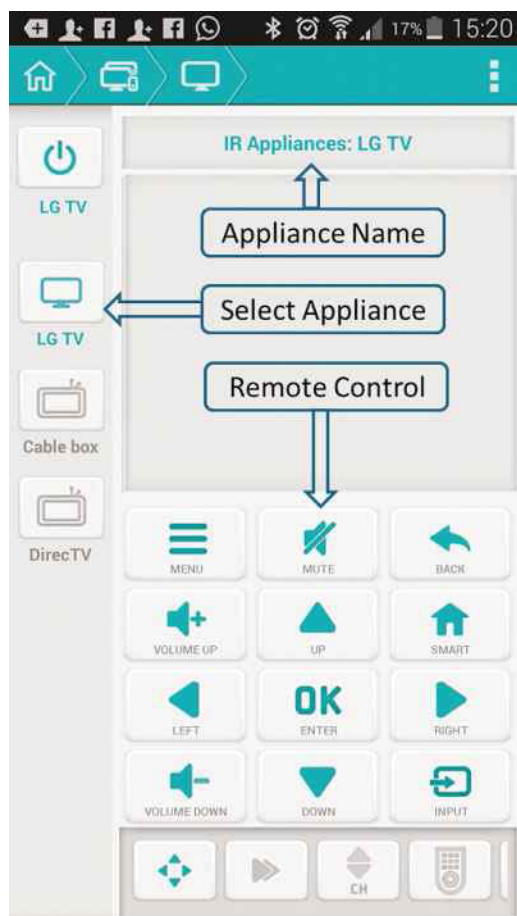
Sure Universal Remote from Israel-based developer Tekoia is described as the best free universal remote control available for Android. That's a pretty big claim, but Tekoia may have the edge on the competition here.

Now on version 3.0.32, Sure Universal Remote is quite an impressive free app. With it you can command your wi-fi smart TV, infrared digital media devices and any home automation appliances you may have installed.

It'll replace your standard TV remote for LG smart TVs, Roku boxes, Samsung smart TVs, Apple TV boxes and Google Chromecast devices. It'll work as a keyboard and mouse for each of these devices, as a microphone for voice control, and it'll pick up anything that's currently hooked up to your home network.

As well as the basic remote control functionality, it also supports streaming picture, video and music streaming from your smart phone or tablet to your TV or other device, and it can even control audio equipment.

In terms of the home automation control, it will pair up with any device that's connected to your network as well as any that can be accessed via infrared. In fact, you can even control some makes of robots.



▲ The compatibility and functionality of Sure Universal Remote is really quite remarkable

Sure Universal Remote is remarkably simple to use, but it's an extremely effective solution for anyone who has multiple and quite different devices or who has several projects on the go and requires an all-in-one remote control to keep them all in check.

As for our real-world testing, Sure Universal Remote attached to and controlled each of our individual devices without any problems, and it communicated with them remarkably quickly too. We had a far better range of service and control over the TV, Blu-ray player, media centre PC and home automation equipment than with any of the other apps.



▲ It's extremely easy to use and the UI looks great too

Interestingly, we were also able to control a set of IR speakers and a Kenwood multimedia in-car entertainment system using Sure Universal Remote, which we think was pretty impressive.

There's plenty to like about Sure Universal Remote. It's quick, easy, looks good and has a great UI, and it's extremely functional and a true universal remote control. There is the occasional advert in the free version, which can be removed for a payment of £2.34 for a one-year subscription, but the adverts are unobtrusive and don't appear that much.

Universal Remote is by far the best universal Android remote we tested in this

group, and we can happily say that it's the one we'd definitely continue using in future. In short, a superbly designed and developed app, well worthy of the £2 subscription per year.

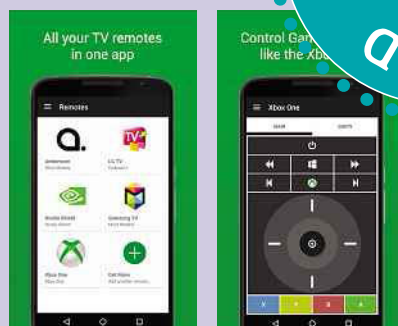




Sure Universal Remote

Sure Universal Remote is a fantastic Android remote control. It can easily manage a huge range of devices and is excellently developed.

This is the only remote control app you'll ever need.



Unified Remote

Unified Remote doesn't cost much to upgrade to the full version, and it's an extremely handy universal remote.

Even the free version, with just the PC control, works well, but it's worth investing in the full version.

How We Tested

Each app was tested on a Samsung Note 4 and connecting to an LG smart TV, Sony Blu-ray player, Minix x86 media centre PC and a set of Archos home automation devices, which included a Mini-Cam, Motion Ball and a pair of Smart Plugs.

	Peel Smart Remote	Smart IR Remote - AnyMote	Unified TV	IR Universal Remote – IR 2.0	Easy Universal TV Remote	Sure Universal Remote
Price	Free	£5.60	75p	Free	Free	Free/£2.34
Adverts	Some	None	None	Some	Too many	Few/none
Tv Remote	Yes	Didn't work	Yes	Yes	Didn't work	Yes
Player Remote	Yes	Didn't work	Yes	Yes	Didn't work	Yes
PC Remote	No	No	Yes	Yes	Didn't work	Yes
Home Automation Remote	Limited	Limited	Yes	No	Didn't work	Yes

Your Letters

TalkTalk Hack

I have just listened to an interview on the World at One with Dido (hope I spelled it right) Harding the CEO of TalkTalk, in which she said the attack was made by criminals several times, as if to say it would have been alright if it hadn't been criminals. She also said she didn't know if the details had been encrypted; you can bet they weren't. What a company!

If I were a customer, I would not be reassured by her statements. Three attacks in recent times and no effort to protect customers – that is criminal. I just hope my details were not on its system, as I left TalkTalk in 2012. Seeing what a sloppy company TalkTalk appears to be, my details are probably still there and my accounts open to a bit of skulduggery. I suppose I

should be grateful that it's criminals doing the hacking not GCHQ or the NSA. I hope they're not strapped for cash.

John James



Planned Obsolescence

I have a Lenovo G500 laptop that has a two-year warranty, which I am very pleased with, except for one thing. Recently, it has been running a little hot. I suspected that the fan might be running slow or the air flow had become restricted. Now, to check this out would require the opening of the laptop, and to do this one needs to remove the label that says "Removal voids warranty".

Well, I have about a month to go of my two years, and the laptop is running okay, but if I leave it running hot, will it fry the mother board?

Having had a previous laptop from a different manufacturer that died with a burnt-out motherboard shortly after the warranty ran out, I decided to open the machine and clean out the filter. Problem solved.

The point is, though, if someone less savvy had been in this situation, they could have had a dead laptop in a month or so time, and out of warranty. Planned obsolescence, I wonder?

Steve Ward (Ramsgate)

Meanwhile .. AVWhy Issue 1382

The current crop of videos featuring actors reciting pop songs in Shakespearian style may well be comedy gold, but the 'slice of genius' award should go to Peter Sellers, who did the same thing 50 years ago. Try his Richard III reciting 'A Hard Day's Night' at youtu.be/zLEMncv140s.

Regards and apologies for the delay in commenting – just catching up with my reading after a month in Greece!

Cluny MacPherson

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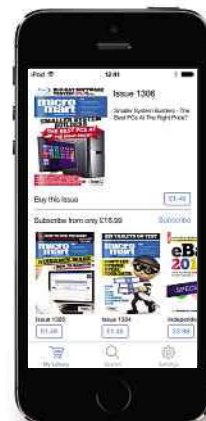
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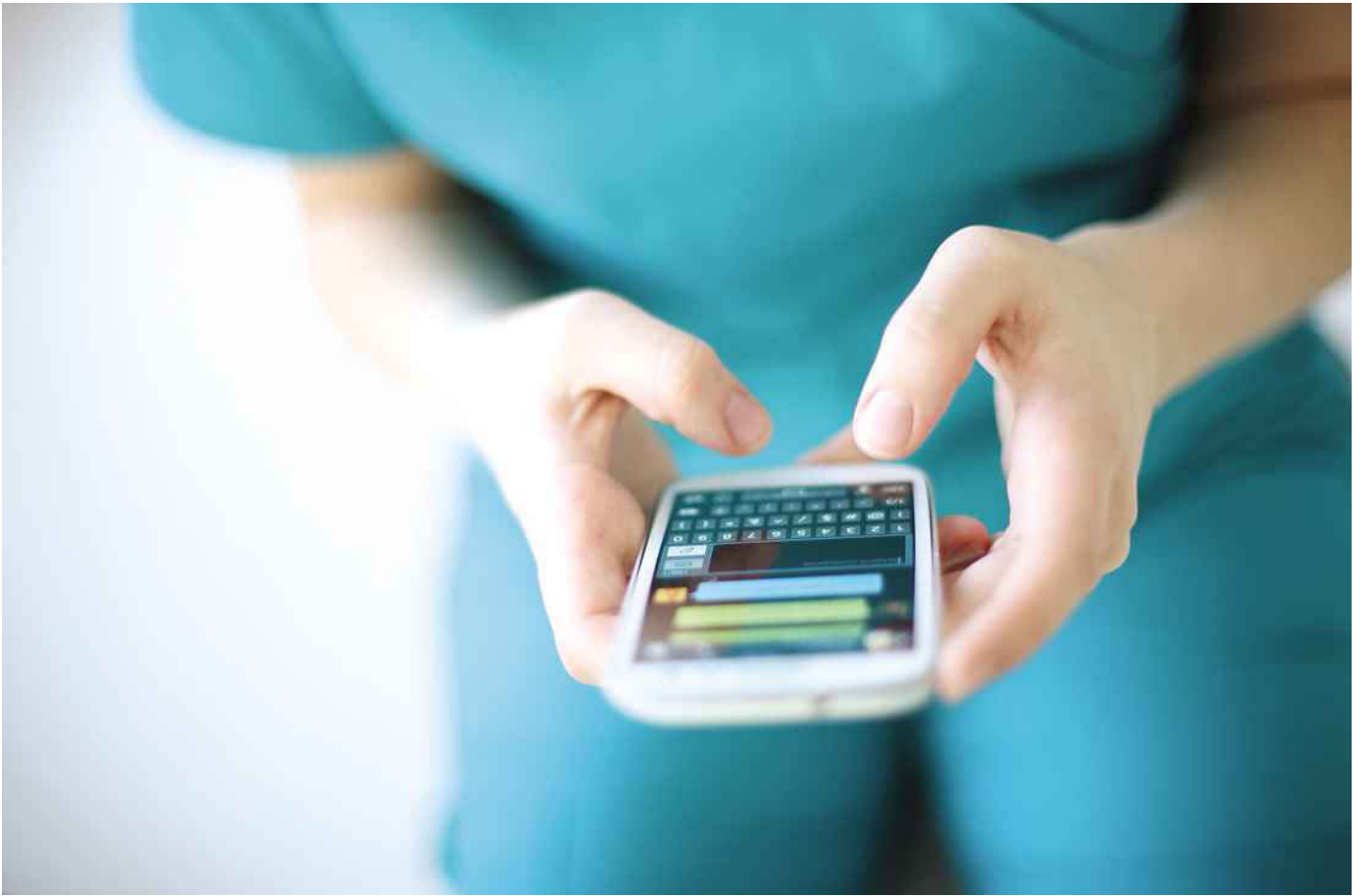


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Is Anything More Hateful Than ‘Read Receipts’?

Sarah Dobbs reckons technology has tried to solve a problem that didn't exist with read receipts – and created a new one in the process



If there was ever a question that didn't really need to be asked, it's "did you get my email?" Of course they got your email... Maybe once, back in the early days of the internet or when spam filters were less selective than they are now, there was a vague possibility that your email might've gone walkabout or end up sitting in someone's junk mail, unnoticed. But that really doesn't happen very often any more. When we ask "did you get my email?", what we're *really* asking is "could you please actually reply to my email?" or "can you do the thing I asked you to do in my email, now or sooner, because I'm getting impatient?"

The thing is, the person being asked knows what you mean too. Yet, because we live in a society where we'd prefer to couch questions in several layers of politeness rather than say what we really mean, "did you get my email?" leaves a handy get-out for the person being asked. They can say no! They can say, "ooh, actually, let me check," and buy themselves a bit of extra thinking time, rather than having to admit that they just hadn't got round to replying or doing whatever the thing was they were being asked to do. Read receipts, though, strip out that layer of plausible deniability. If you've ever had a boss who used read receipts on work emails, you'll know how invasive they can feel when you're on the receiving end.

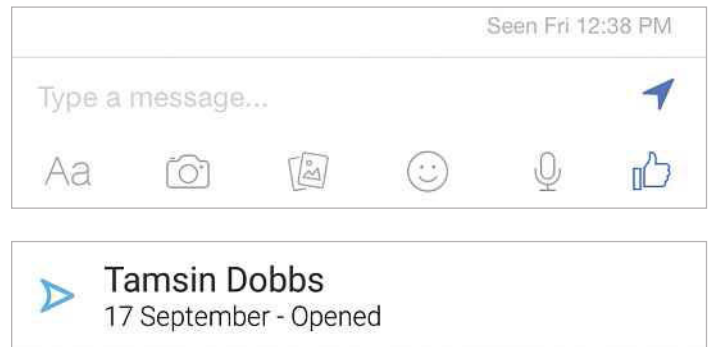
“ If you’ve ever had a boss who used read receipts on work emails, you’ll know how invasive they can feel ”

Thankfully, most people stopped – or never started – using read receipts on emails. Like so many inventions, they just weren't doing anything useful, so most people didn't bother. Yet, over the last couple of years, read receipts have started creeping back into our lives through the apps and social networks we use. So, if you thought read receipts were annoying when they were attached to professional communications, you're no-doubt aggravated about how awful they can be when they're attached to social or – God forbid – romantic messages...

I Know When You Read That Message

As long as social media has existed, it's had read receipts built in. If you can bring yourself to think back to 2005, you might remember that MySpace's messaging function had them. At any time after sending a message, you could look at your sent items folder and see if the person had looked at your message. This, if you were young and single and prone to overthinking things, could lead to literally hours of soul-searching, as you wondered why the object of your affections hadn't responded to your carefully crafted missive. If they'd already read it, why wouldn't they just reply?!? Argh!

MySpace gave way to Facebook, Twitter and half a dozen other social networks, but this new generation of social networking tools is similarly plagued with ways to tell if the recipient of your message has opened it or not yet. Snapchat tells you when it's delivered your snaps and when the recipient has opened them; it also tells you exactly who's looked at any of your Story pictures.



WhatsApp does the same: you get a grey tick mark next to your message when it's been sent, two grey ticks when it's been delivered and two blue ticks when it's been read.

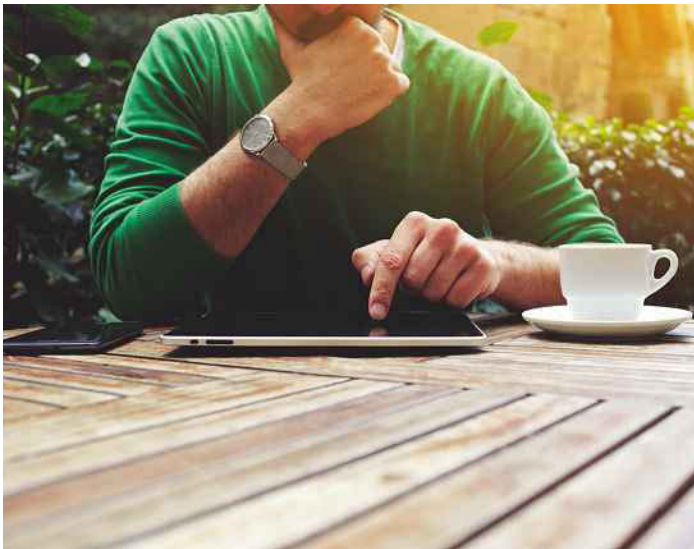
Facebook is the worst offender, though. As if it weren't enough that it pushes its awful Facebook Messenger on you, as if it weren't enough that it already decides you don't need to see some of the messages people have sent you, helpfully filing them in an 'other' folder no-one ever remembers exists, it also insists on telling you when someone has read your message, sticking a little 'Seen' with a time stamp under your messages. What's worse, it's working on adding read receipts to event invitations – so if you don't feel like going to your friend's improv comedy night, Facebook's engineers are now attempting to nuke your ability to say you didn't see the invitation.

Whyyyyyy?

The thing is, read receipts are solving a problem no-one really has. What good does it do you to know when someone has read your email, if they still haven't done anything about it? None. What good does it do them to know you read their email at midnight but haven't replied to it by 10am the next morning? None. There's nothing you can do with that knowledge except get passive aggressive.

The good news is, in a lot of cases you can turn off read receipts or opt not to send them back, so the sender will only ever know





you've read their message when you actually reply to it (see our boxout for how-tos). The bad news, though, is that sometimes you can't. Sometimes you're stuck with the useless thing.

While you might be *technically* able to turn read receipts off, you may decide not to because of the consequences. If it is your boss who's sending all these trackable emails and messages, for example, turning off read receipts might make them think you're ignoring them. That, we're afraid, might not be terribly helpful to your career prospects – especially if the rest of your colleagues are happy to submit to such technological tyranny.

“ How hard could it be to add a feature allowing us to recall as-yet-unread emails? That'd be a good start ”

Then again, if that's the situation, it's as much a people problem as a technological one. In fact, that's actually the whole issue here: read receipts don't really take into account the way people really interact or want to interact. We've seen that kind of thing a lot over the years; even video calls took a long time to take off because actually, a lot of the time, it's more convenient to talk to someone without being able to see them (or them being able to see you). Facetime and Skype calls are quite common now, but they're still not the default. Sometimes, we don't want everyone to know everything about where we are, what we're doing and when we're doing it.

An Alternate Wishlist

You know what would be a load more useful than read receipts, though? A way to recall emails and texts after you'd sent them. A proper way, not the half-hearted fake email recall you can do now, that just sends a followup email asking the recipient not to read your previous missive. All that that does is to make absolutely sure that the other person will read the email you don't want them to, when otherwise they might have missed it.

Of course, there's a problem intrinsic to texts and emails, one that also makes them so popular: they are delivered almost

How To Turn Off Read Receipts

Don't want people to know you've read their message? Want a workaround so you can read and reply to stuff in your own time without sending the person you're talking to into a tailspin of anxiety about why you haven't answered them yet? Here's how:

Email

This depends what email client you're using, but there should generally be a way to do it. In Outlook, you'll need to go into the File menu, click Options, and open up the Mail tab. Under Tracking, you can untick the Delivery Receipt box (different versions may vary slightly, but it'll be there-ish). Also, a lot of the time you'll be asked whether you want to return a read receipt for an individual email, so you can just refuse.

iMessage

Pretty straightforward, this one: open Settings, scroll down to Messages, and then in the Messages setting, toggle the Send Read Receipts switch off.

Facebook

Unhelpfully, there's no setting in Facebook for hiding that horrible 'Seen' status under a message. What you can do, at least on your computer, is install a browser extension that prevents Facebook from doing it – try Unseenly or Facebook Unseen. Adblock Plus will also let you set a custom filter that blocks Facebook from knowing you've read messages, but that's a bit of a faff. Also, there's nothing you can do about it in the mobile app. Sorry!

Snapchat

Again, nothing you can do about this. Snapchat is the ultimate tattletale, since it also notifies people if you've screenshotted their picture, but then the ephemeral nature of Snapchat messages is pretty much the point, so it's probably not worth arguing with.

WhatsApp

WhatsApp's read receipts used to be non-negotiable, but you can now turn them off – if you're using Android, anyway. Go into Settings, tap Privacy, and scroll down to untick the box marked Read Receipts. Unfortunately, you can't turn these off in group chats, so if you use WhatsApp to talk to multiple people simultaneously, you're still going to see them. ✓✓

instantly. That, however, means that by the time you've realised you've sent a big moan about your mum to your mum's email instead of to your best friend, she might have already opened it. How hard could it be to add a feature allowing us to recall as-yet-unread emails, though? That'd be a good start – at least it'd mean unwise late night messages could be recalled, anyway.

We'd also like a way to quickly and easily block certain people we never want to hear from or about, ever again; an app that stops other people posting unflattering pictures of us online; and probably some kind of built-in breathalyser for our phones so we can't post ill-advised tweets on our way home from a night out. They'd all be more useful than read receipts. Get on it, developers. [mm](#)

Top 5

Laws Of Platform Games

Where would Mario and Sonic be without these?

1 Leaps And Bounds

More than anything, a platformer needs platforms, things to jump on, leap off and hop over. That, without doubt, is an absolute must. What's not so necessary, however, is that these obstacles stick to the rules of physics. How often, for example, have you seen games where the things you jump on are just floating in the air, as if held there by magic? Imagine, though, if platform games were based on real life. The biggest hurdle you'd probably have to get over would be when you climb the broken-down escalator in the tube station, on your daily commute. Or perhaps your greatest struggle would be just dragging your tired bones out of bed. Wouldn't make for much of a game, though.

2 Ice To See You

If you're a game designer and you create a platformer without an ice or snow level, then you're doing it wrong. You must have a wintery level – it's the law. And it must make running more difficult, causing you to slide around all over the place like Torvill and Dean (but probably without the spangly outfit). Of course, you might wonder why someone doesn't just come along and put some salt down, but as we've seen in the real world in recent years, the authorities always seem to be completely unprepared when white stuff falls, so maybe it's the same in platformer universe.

3 Falling Down

In a world of stringent safety rules and regulations, even a crack in a pavement could be a potential injury lawsuit. So the idea

of having vast, bottomless chasms just lying around all over the place doesn't even bear thinking about – unless, of course, it's in a platform game. Here, when there's a huge hole in the ground, the council doesn't send a team of workmen to put warning signs around it and fill it in with concrete. No, if you're one of the Marios or Sonics of this world, you just have to try not to fall into them, because you don't get to sue anyone if you do.

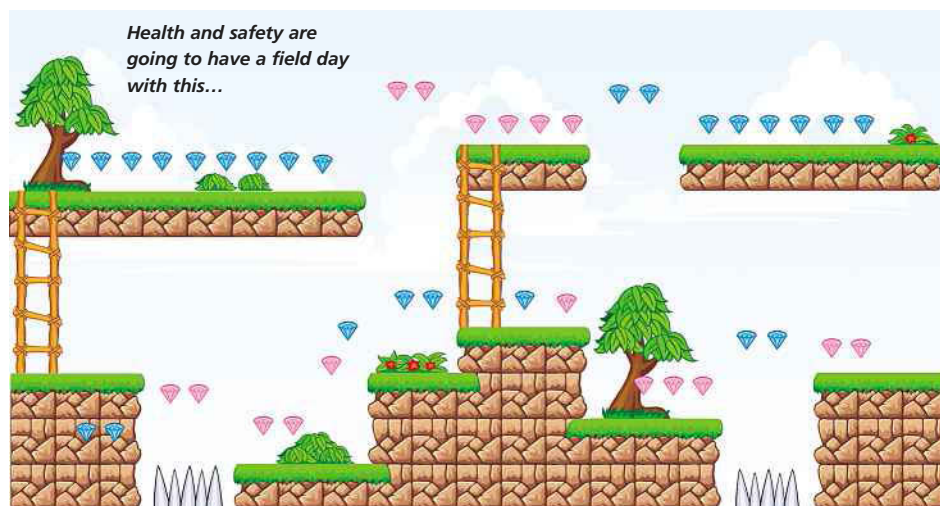
4 Bossy Boots

The idea of the boss battle makes a certain kind of sense. If you're at the top of the bad guy tree, you're probably going to send your lackies in to do the heavy lifting, while you just sit in your plush office, playing solitaire and pretending to work. But that logic doesn't really apply if you're a giant monster of some kind, with the ability to crush your enemies while barely moving a finger (or tentacle). In platform reality,

though, rather than just quickly trying to destroy the hero before they get too far, bosses always wait until things are getting out of hand and all their minions have been killed, which really shows poor management skills. That said, they probably still get their bonuses anyway.

5 Die Until Dead

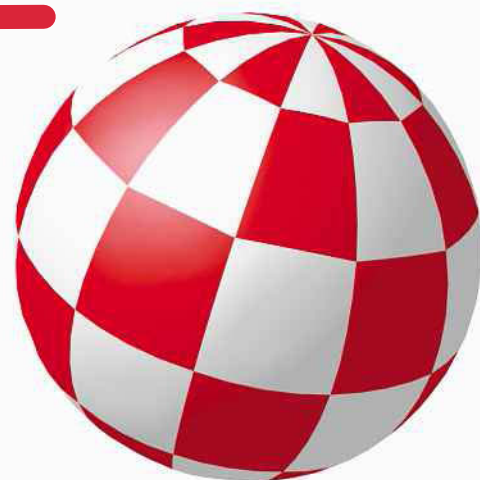
Being the hero in a platformer comes with an odd mixture of strengths and weaknesses. On one hand, you can leap great heights and destroy your enemies simply by jumping on top of them. On the other hand, if you walk into them, then you die. The good news, though, is that you come back to life. Great! You die, but you don't die. Unless you die three times (sometimes five), because if that happens, then you're really dead. Unless you have continues, in which case you get to die and come back to life all over again. Then when you've run out of those, you're definitely 100% dead. Probably.



The Amiga

Part One

In 1982, Jay Miner left Atari to form a new company to produce the most powerful games console ever created that could be upgraded to a full computer. Sven Harvey explains



The story starts in 1982, when Atari employee Jay Miner formed a group of engineers into a new company called Hi-Torro. Their intention was to build a new games console that could be upgraded via an add-on into a full home computer, based on Motorola's new 68000 processor, which had a 32-bit core and 16-bit data bus – a revolutionary jump in computing power compared with the 8-bit processors and machines dominating the industry at the time (and for years to come). The Lorraine computer was also to feature a 3.5' floppy disk drive – a new technology at the time. And thanks to the included keyboard and mouse, it would allow anyone to develop games for the platform, compared with the expensive workstations needed for games consoles of the time such as Atari's VCS. Hi-Torro soon became Amiga Corp (Dave Morse chose the name, which literally means female friend), and with the videogames crash, by 1993 the machine was aiming to be more a computer than a games console, as the likes of the Commodore 64 and Atari's 8-bit computers seemed to ride the storm well.

Jay's former work included working on the Atari 2600 and Atari 800, and it was with Tonka Toy's Dave Morse that he founded the company and brought on board Carl Sassenrath (Amiga OS kernel development), Dale Luck (core OS engineer), Joe Decuir (custom chip engineer), RJ Mical (Amiga OS/Intuition interface engineer) and Ron Nicholson (custom chip engineer). Then slightly later, Dave Needle joined, engineering the custom chips after getting a job as a janitor at the company and making suggestions when he saw the work Joe and Ron were doing! It was Dave who also realised that Mitchy, Jay's dog, was indeed making some design decisions with the shake or nod of his head! While the Lorraine project continued, the other part of

the company was making accessories for the Atari 2600, such as joysticks and the infamous Joyboard. This controller, which you stood or sat on to control eventually led to the term 'Guru Meditation', for when the computer crashed and an engineer working on Lorraine sat on the board to contemplate errors.

Money Problems

The Lorraine was a massive undertaking. Each and every circuit that made up the custom chips was painstakingly drawn out by hand, as the computers of the time simply weren't up to the task – not at prices that were remotely within reach. Time and money, even after multi-mortgages, was running out, and with a cash injection needed immediately, the company borrowed US\$500,000 from Atari, Inc., which at the time was owned by Warner Communications and was Jay Miner's former employer. The agreement was that Amiga Corp. had to pay back the money to Atari, Inc. by the end of June 1984. Neither company lasted that long.

Meanwhile at Commodore, the company's saviour, who had bailed out the company to millions of dollars by this point, had a massive falling out with the founder. Jack Tramiel founded Commodore Business Machines after emigrating to the USA following his rescue from the concentration camps (he was a Polish man of Jewish descent). Unfortunately, a successive loss of business twice to Japanese imports and then to its own chip supplier for calculators, Texas Instruments, had resulted in Canadian businessman Irving Gould essentially owning the





▲ The Commodore Amiga, and associated software and peripherals reported to have belonged to Andy Warhol

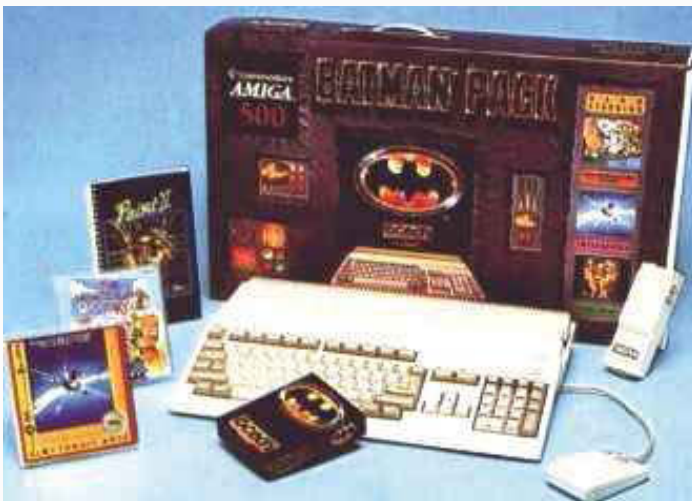
to buy the company, with an immediate advance to cover the US\$500,000 plus interest owed to Atari, Inc, which was paid back on 30th June, to claw Amiga Corp. out of its agreement, the day before Atari, Inc. ceased to exist. Commodore completed its due diligence by August (after pumping more money into Amiga Corp. to keep it going) and announced the purchase and creation of Commodore-Amiga, Inc. on 24th August. Jack Tramiel's team discovered the documentation about the agreement and used it in a counter suit against Commodore's litigation. The Amiga and litigation have been orbiting each other ever since.

Commodore-Amiga, Inc.

The original Commodore Amiga machine, which we now call the A1000, was unveiled at the Lincoln Centre in New York in July 1985, with the aid of Andy Warhol and Debbie Harry. The machine was actually released in the autumn of that year, and later in PAL territories, such as the UK. However, the pricing of the machine and positioning as a small business computer that could be used in the home won it little favour, and further models were needed to make the most of the markets it could make in-roads into.

The Amiga 2000/500

1986 saw what we call the A1000 now being the only model available, while a team in Germany and a team in the USA developed its replacement. The A1000 derived A version of the Amiga 2000 won the race and was released, only to be unreliable



▲ The biggest selling bundle of the biggest selling Amiga

company and helping it purchase MOS technology and bring Chuck Peddle in. This resulted in the KIM-1 and the Commodore PET. Jack continued to run the company and his brilliant cost control measures meant that through the launch of the Vic-20 and Commodore 64, Commodore turned a profit while the other companies, Atari, Inc. included, weathered the videogames crash much worse. However, at CES 1984, the difference of opinion between Jack and Irving became too much, and Jack walked out, never to return. After a short break, Jack founded Tramel Technology, which then managed to acquire all the consumer parts of Atari, Inc. (leaving the newly created Atari Games coin-op company, which then used the name 'Tengen' for home releases, as part of Warner). Tramel Technology then became Atari Corp. on 1st July 1984. One of the first acts was to suspend all hardware development and fire most of the hardware team, only to replace them with Commodore engineers who had been working on new projects at the boss's former company. Irving Gould wasn't pleased and started legal action against Atari Corp.

Commodore, after seeing the Lorraine on Amiga Corp.'s stand at CES, started talking to Jay Miner, Dave Morse and the team about the Lorraine. In the early summer, it started due diligence

The Commodore Amiga (1985)

(aka the A1000)

68000 CPU

256KB/512KB ChipRAM

OCS Chipset

Amiga OS 1.0-1.3

The original Commodore Amiga that was later renamed the A1000 as the A2000 and A500 were announced. The casing featured a garage that allowed the keyboard to be tucked in under the machine, and the inside of the top of the casing featured the signatures of the original developers of the platform. Initial NTSC units came with 256KB of ChipRAM, and the machine could be upgraded to 512KB using a front panel expansion (which was bundled with the machine in short order). A side expansion slot (a DMA connected Zorro (I) slot) allowed the addition of hard disks, memory, CPU expansions and even PC sidecars to allow the machine to run IBM PC compatible software. Kickstart (the initial part of the OS) was booted from disk prior to booting Workbench, the Amiga WIMP graphic user interface. For reference, ChipRAM is shared between the CPU and the custom co-processors (the Amiga chipset), in a similar way to modern unified memory, as opposed to video RAM, while 'FastRAM' was available only to the CPU.



▲ A USA released Commodore Amiga



▲ A UK released Amiga 1000

and be replaced by a cost-reduced version, developed by Dave Haynie, of the American design. This was released as the B version (called the B2000 here in the UK). Interestingly, the development of the Amiga 500, and its refinements to the chipset over both

The Amiga 2000 (1987)

(also A2500 (USA), A1500 (UK))

68000 CPU

1MB RAM (512KB ChipRAM, 512KB FastRAM)

OCS/Revised OCS/ECS chipset

Amiga OS 1.2-2.0

The A2000 went through many revisions, with the second much better designed unit sometimes being referred to as the B2000 or A2000B. This had some of the chipset refinements from the A500 and better integration of the Zorro II slots and video slot. Much later versions included chipset upgrades. Sold as the A2000 with or without a hard disk, a USA variant, the A2500, came with a hard disk as standard as well as a CPU accelerator card with either a 68020 or 68030 processor. The A1500 was a UK only barebones A2000 with a second floppy disk drive. The casing was huge and had huge expansion potential with the array of Zorro II slots. The choice to include a video slot specifically connecting the machine's video and graphics sub systems allowed the development of the 'TV station in a box' that was the Video Toaster. Early Video Toaster all-in-one units sold into TV stations and production teams were A2000s or A2500s with the Video Toaster preinstalled and a video toaster sticker put across the front (later versions used the Amiga 4000). This was the first machine to feature Kickstart on ROM so it could boot directly to Workbench from floppy or hard disk.



▲ The A2000 was significantly bigger than the A1000.



▲ The UK exclusive A1500 was originally sold in a 'Personal Home Computer (PHC) Starter Pack.'



▲ Ocean's Batman game based on the 1989 film that was bundled and swayed customers

the German developed A2000 and the A1000 would feed back into the B2000.

It was the release of the A2000 that resulted in the original Commodore Amiga being rechristened, but it was clearly the A500 that grabbed the attention of hobbyists and gamers in the UK and mainland Europe (especially Germany). The A500 screamed Commodore in looks and echoed the Commodore 128 in style and provided the Commodore 64 community with a tantalising upgrade route. However, initial sales were slow, as the launch price was simply too high at £599.99. However, in the UK (and slightly later across Europe), this would alter dramatically with a change in tack, thanks to Commodore UK's new team. David Pleasance went to Ocean, who had just paid a huge (at the time) US\$1 million for the licence to the *Batman* film starring Jack Nicholson and Michael Keaton. His offer was almost laughable, but managed to convince Ocean's top brass by leveraging Commodore UK's bigger marketing budget. The result was the A500 Batman Pack. Released several weeks before the game would be available as a stand-alone product, the Amiga version was superior to all the other versions of the game, both in graphics and gameplay, and was advertised

The Amiga 500 (1987)

(also A500 Plus - 1991)

68000 CPU

512KB/1MB ChipRAM

OCS/Revised OCS/ECS chipset

Amiga OS 1.2-2.0

The first of the entry-level Amiga computers, the A500 has all the features of the A1000 bar the casing packed into an all-in-one unit similar in overall concept to Commodore's C128. The machine was revised continually and sold exceptionally well in the UK and Germany. The ease of expanding to 1MB of RAM via the trapdoor allowed game developers to program for 1MB and, indeed, the machine was often bundled with the A501 expansion. The last revision was the A500+ with 1MB on board as standard, as well as the full ECS chipset and Amiga OS 2, and it could accept a trapdoor expansion to get up to 2MB. The A500 Plus originally turned up by stealth in the UK masquerading as normal A500s in Cartoon Classics packs. It was actually quite funny watching dealers at the World of Commodore show in November 1991 open up Cartoon Classics packs to find these strange upgraded A500s, and Commodore UK didn't even know itself! All A500s had a DMA Zorro slot as on the A1000, but mirrored, allowed the further expansion of the machine with more RAM, hard disks, CPU upgrades and so on. The A500 series was the biggest selling Amiga by some margin during its availability from 1987 to 1992.



▲ The Amiga 500 – the biggest selling Amiga model.



▲ Hiding in Cartoon Classics packs over Xmas 1991, this upgraded A500 had some game compatibility issues.



▲ 1989's *Shadow Of The Beast's* rolling demo appeared in retailers and sold machines



▲ The Amiga 500 bundle sold for Christmas 1990

in cinemas. The bundle included *New Zealand Story*, *F/A-18 Interceptor* and, perhaps most importantly, *Deluxe Paint II*. The price was £399.99 – and Atari had no answer to it, after outselling the A500 for two years with the 520ST. However, it has to be said, the fact that the rolling demo of *Shadow Of The Beast* was doing the rounds in retailers at the time did the machine no harm sales wise! The Batman pack was the biggest selling of the A500 bundles, and the A500 became the biggest selling Amiga model ever made, winning European Computer Of The Year more than once and cementing itself as a computing legend alongside the C64.

Further Development

The development of the Amiga chipset, though slower than it could have been, eventually produced the ECS chipset, and the A2000 got a replacement in the form of the much smaller Amiga 3000 (and later a much bigger A3000T tower unit).

Commodore also developed its interactive multiplayer system, the Commodore Dynamic Total Vision (CDTV), which was supposed to offer people interactive multimedia in the home. The problem was that the general public at the time had no idea what that meant, and it wouldn't be until the advent of the PlayStation and the DVD that people would expect their entertainment on a 5" optical discs.

With advances in technology, the development of the Amiga chipset and Commodore UK gaining access to its own factory in Scotland, 1992 proved to be an interesting year, as we'll find out next time... [mm](#)

The Amiga 3000 (1990)

(Also A3000UX, A3000T)
68030 CPU

2MB ChipRAM

ECS chipset

Amiga OS 2.0

Derived from a project to produce a new 68020 motherboard without the on-board 68000 for the A2500, but with the addition of the new Zorro III slot and a further CPU uprate, the Amiga 3000 was a jump up from the A2000, thanks to the fully 32-bit expansion slots and optional 32-bit FastRAM available to the CPU. This was the first machine to ship with Amiga OS 2 and also came in tower cased A3000T and Unix booting A3000UX variants. Early units booted from SuperKickstart disks/HDD bootstrap code, though later units had Kickstart ROMs.



▲ The Amiga 3000 introduced the 32-bit Zorro III expansion slot



▲ The later form of the A3000 literally towered over the competition

The Commodore Dynamic Total Vision (1991)

(aka CDTV, aka Amiga CDTV)
68000 CPU

1MB ChipRAM

Revised OCS/ECS chipset

Amiga OS 1.3-2.0

Too much too soon: essentially a 1MB A500 in a hi-fi-like casing with a CD-ROM drive, aimed at a multimedia market that wouldn't turn up (and even then in a very limited way) until the advent of the DVD. Sold with an infrared remote and having no mention of the Amiga attached to it in any way, shape or form (until much later), Commodore insisted that it was displayed with AV/home audio equipment and away from the computer products. This worked so well after selling into the retail channels that when David Pleasance took over USA sales he had to take thousands back in exchange for more 'normal' Commodore hardware to retain the accounts. The CDTV had special versions of the 1.3 and 2.0 Kickstart ROMs.



▲ The Commodore Dynamic Total Vision – an idea too far ahead of its time, using technology that was looking long in the tooth



▲ Before long, the CDTV got bundled with a keyboard, mouse and disk drive, and was marketed as the Amiga CDTV... at least in the UK

Code With AI2

Translate

Build an Android multi-language translation app with David Briddock

Last time we built a speech-enabled memo app. This time we'll use similar technology to build a language translation app. Instead of having to type in the text to be translated, we'll once again use the Speech Recognition component so we can simply speak a phrase. Then we'll provide a range of language choices for translation, too.

This week, you will need a Windows/Mac/Linux PC, web browser and Google account to access AI2, and an Android smartphone or tablet to test the app's features.

What We'll Learn

Although we've used the speech recognition component before, here it will be integrated with the Yandex Translate component and its associated web service. That's a service that can translate a text in one language into dozens of other languages (there's a full list of the options at goo.gl/t5Q2s9) – and it all happens in a second or two.

We'll also use the Spinner component to offer a selection of translation languages.

Starting AI2

In your browser navigate to the AI2 home page (ai2.appinventor.mit.edu) and sign in with your Google account. We need a new project so in the Projects menu select the 'Start new project' option and give it a meaningful name, such as 'MMTranslate'.

Screen Properties

After that process, we're automatically taken to the Designer View where there's already a component called 'Screen1'. All the other components will be dragged and dropped onto this screen. To the right is the Properties panel for the currently selected component.

Using this panel, make sure the AppName is set to 'MMTranslate', then set the Title to 'MM Translate' and the Orientation to 'Portrait'. Now we'll add some screen components.

Screen Design

In the left-hand component Palette, open the User Interface group, grab a Label and drop it into the Screen1 area in the Viewer panel. With this label selected, rename it to 'FromLabel', then set the FontSize property to 20.0, the Height and Width to the 'Fill Parent...' option and delete the Text contents.

Back in the User Interface group, grab a Spinner and drop it into Screen1 just below the FromLabel. A blue bar appears to indicate its drop position. With the spinner selected rename it to 'LanguageSpinner', then in the Properties panel set the Width to the 'Fill Parent...' option.

Back in the User Interface group, grab another Label and drop it onto Screen1 underneath the spinner. Rename it to 'ToLabel', then in the Properties panel

set the FontSize to 20.0, the Height and Width to the 'Fill Parent...' option and delete the Text contents.

A single button will kick off the whole phrase capture and translation process. Grab a button from the User Interface group and drop it underneath the ToLabel. Rename it to 'TranslateButton', then in the Properties panel click on the FontBold checkbox, set the FontSize to 20.0 and set the Width to the 'Fill Parent...' option.

Language List

Our languages will be defined by two character codes, for example 'fr' for French, 'de' for German and so on.

To create the list first select the LanguageSpinner component then set the ElementsFromList property to the text string 'fr,de,es,it' (you can expand this comma-separated list later).

We also need to define the default language option, which is done by setting the Selection property to 'fr'.

Non-visible Components

We'll also need to add two non-visible components. The first is a SpeechRecognizer component from the Media group. Grab one and drop it onto Screen1. Notice that an icon appears in a Non-visible Components area underneath the screen.

The second of these non-visible elements is a YandexTranslate component, also from the Media group. Once again grab one and drop in onto Screen1.

Button Click Code

Now it's time to start coding so click on the Blocks View button located on the green bar.

We've already populated our language spinner control with the language codes and set the default code language, so from a coding perspective, all we need to do is to handle the translate button click event.

To kick off the whole translation process we need to fire up the speech recognition engine. Click on the LanguageButton component, grab a brown 'when TranslateButton.Click' block and drag it onto the Viewer panel's coding area.

As you can see from the Blocks View image inside there's just a single block. From the SpeechRecognizer1 component grab a purple 'call SpeechRecognizer1.GetText' block and snap it into position inside the brown block.

Speech Recogniser Event

Next we need to handle the event that's generated when the speech recogniser service has captured the audio and converted it to a text string.

Click on the SpeechRecognizer1 component, grab a brown 'when SpeechRecognizer1.AfterGettingText' block and drag it onto the coding area.

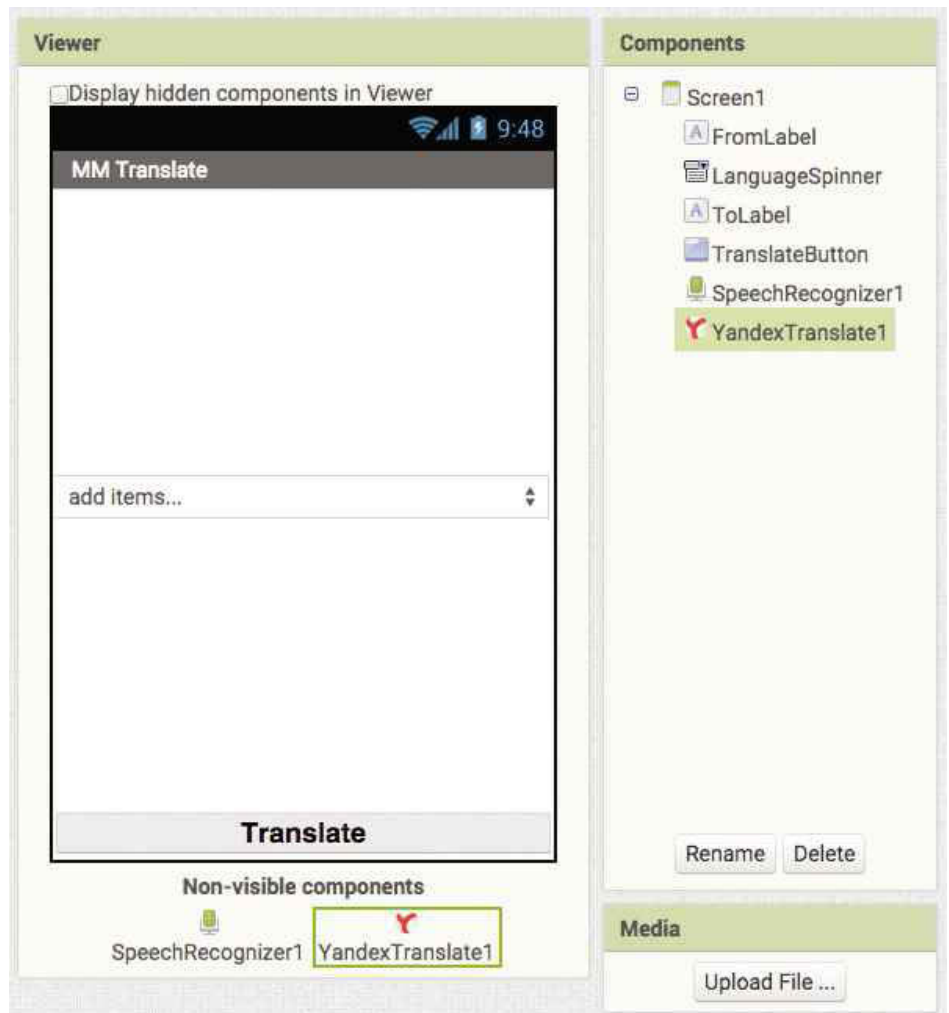
Inside we'll first set the FromLabel contents. This is done with a green 'set FromLabel.Text to' block. To set its value hover over the 'result' attribute in the parent brown block, grab the orange 'get result' block and snap it onto the end of the green block.

Now from the YandexTranslate1 component grab a purple 'call YandexTranslate1.RequestTranslation' block and drop it underneath the green block. Set 'languageTo TranslateTo' value with a light green LanguageSpinner.Selection block. Then set the 'textToTranslate' value with an orange 'get result' block.

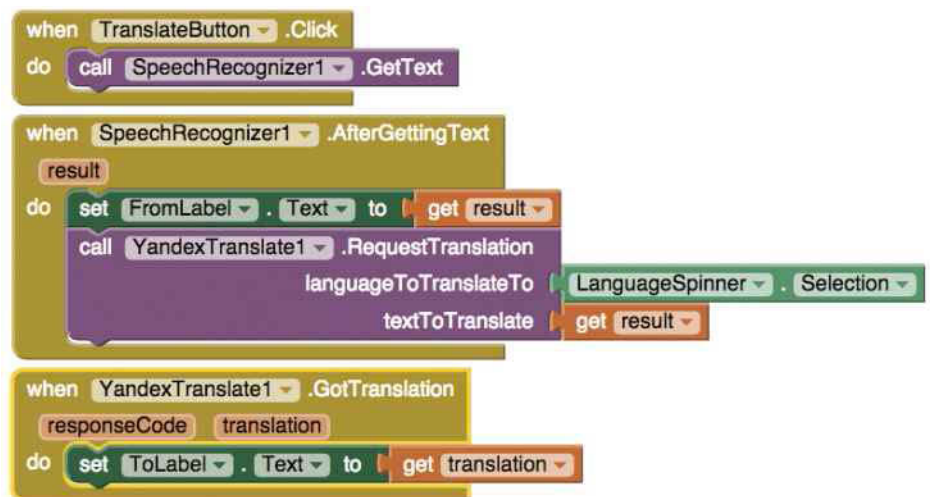
Translation Event Handler

Finally we need to handle the translation completed event. Click on the SpeechRecognizer1 component, grab a brown 'when SpeechRecognizer1.AfterGettingText' block and drag it onto the Viewer panel coding area.

Inside we'll set the ToLabel contents with a green 'set ToLabel.Text' block plus the 'get translation' attribute from the parent block.



▲ AI2 designer view



▲ AI2 blocks view

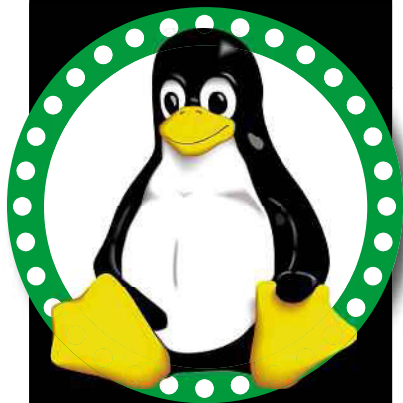
And that's the coding done. Ensure the warning and error counts in the bottom left corner are both zero and carefully check your code against the Blocks View image.

Testing

Test with the AI Companion App installed on a real Android device (as we discussed

earlier in the series). This device we'll also have to be connected to the Internet. Side-load the finished app onto an Android device (goo.gl/ZMKgAe) so it's to ready and waiting whenever you need to translate a phrase.

Next time we'll build an app that displays our current GPS location on a map. [mm](#)



David Hayward has been using Linux since Red Hat 2.0 in schools, businesses and at home, which either makes him very knowledgeable or a glutton for extreme punishment

Linux

Astro-Linux

Moving my astronomy kit to Linux

Up until a week ago I had my main astronomy laptop running Windows 7, controlling my Celestron NexStar 5SE and my Orion StarShoot USB camera. It was a happy partnership, and barely anything ever went wrong.

However, the poor laptop decided to end it all one night, and instead of sitting there on the bench quietly recording a video of the moon, it took a nose dive into oblivion. Sadly, the laptop died and with it went my astronomy setup.

After swearing loudly at the remains of the laptop, I decided it was time to Shanghai my Linux Mint laptop into active service. But I was always a little wary that the telescope and the connected items wouldn't work as well with a Linux build as they would with a Windows build – since the kit never mentions Linux compatibility with it.

Stellarium

The first port of call was the Linux version of Stellarium, a product that I've known for years has worked magnificently in nearly every distro I've ever tested.

With Stellarium installed, it was time to work out what the serial-to-USB cable I use

to hook up the telescope was going to be called in Linux, as opposed to COM3 in Windows. It took a few minutes to create the new ttyS3 port and make sure that it was actually the right port I was addressing (it's not something I do on a regular basis), but once it was up and running, it was just a matter of enabling the Telescope Control script within Stellarium and restarting the program.

Thankfully, I managed to hit the nail on the head the first time. And by pressing Ctrl and the number 1 (since this was the only controlled telescope in my arsenal), the scope tried to move to the selected star. I need to make sure it was aligned first via the telescope handset, then it can be controlled via Stellarium.

Cheese

The next thing to get up and running was the USB camera, so I could take stills and shoot videos of whatever is at the other end of the eyepiece. The supplied software, Orion AMcap, is Windows only, so to begin with I played around with getting it running under Wine.

Sadly, although it did work for a moment or two, AMcap decided it didn't like Wine – or vice versa – and refused to work again. Looking at

it logically, AMcap is simply a video capture program that integrates with the USB camera, which essentially is just a clever webcam.

With that in mind, I powered up Cheese and – hey presto – it picked up the Orion StarShoot and I could get the same spectacular images as I could before.

Another addition to this is Gimp, to help modify and colour the images once they've been captured.

NexStar Remote

The correct name for this is NexRemote, and it allows you to remote control the handset on a NexStar telescope via the COM port and the software, which again is Windows based.

Thankfully, this did work well with Wine, and I had the telescope scanning across the skyline in no time.

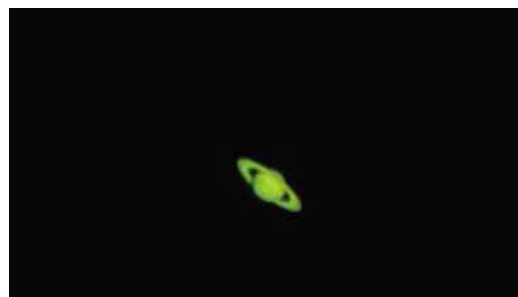
Linux Win

I'm not sure why I hadn't used a Linux machine before with my telescope setup; it started that way and worked, so I guess I saw no need to ever change it.

Anyway, I can now happily control my telescope even on the coldest night, while I sit in my shed and view all the heavens have to offer.



▲ The moon: a still taken from a video



▲ A still and Gimp-coloured Saturn

Sounds Unlike Silence

Sven Harvey checks out a new batch of tuneage from Amiga Remix

It's been a while since I popped onto Amiga Remix, mainly because updates for the last couple of years have been slowing down, but I was very glad I did.

With a major upload on 20th October on the site, I was rather entranced by a new arrangement of the Thesmophoria theme (also known as the 'old-timer theme') from Team 17's Project X. The original was by Allister Brimble, but this new version by Andrea Baroni is in a completely 'acoustic' style, featuring harp, woodwind, string and acoustic guitar instruments. The music is basically the same as the original synth version, but the instrumentation gives it a whole new feel, and though there are a couple of missteps, it's a great track that's well worth a download.

Another remix by the name of Synchaoz has reappeared after having his first and, up till this point, only release put out on AmigaRemix in May 2008 ('The Lost In Service' theme from *Cannon Fodder* in that case). He has two new mixes up in the form of a medley of Brian Johnston's music from *Hired Guns*, which is rather good, though I am not a big fan of the game and therefore don't know the music all that well. However, the other mix is from a game I played a lot: *Lotus III*, from Gremlin's *Lotus Turbo Challenge* series. As with the previous two games, also made by Magnetic Fields for Gremlin, the music is by

the excellent Patrick Phelan. This new arrangement is of the opening theme, complete with the intro section featuring some heavy sampling of the original. Then from one minute and 20 seconds in (I kid you not), the actual theme kicks in, and though most of the instrumentation sounds very similar to the original, the lead is an electric guitar, which suits the music down to the ground. Shame this wasn't on the CD32 version!

Finally, I'd like to draw your attention to a rather laid-back version of the theme from the Bitmap Brothers' *Gods*. A remixer by the name of Mano has rearranged Nation 12's original using a more traditional piano instrument

and generally made the theme feel much more old world, which is appropriate given the subject matter, and expanded the choral elements, making a piece of music that is a joy to listen to. A fantastic track to check out!

Pop along to www.amigaremix.com to get these tracks and many others!



News Bytes

AmiKit – a new version of the emulation environment is now available, following a release at the German Amiga30 event in October. AmiKit Portable is a metal USB stick (16GB) with a bootable version of AmiKit, which, once loaded with the files from Amiga Forever to provide Kickstart ROMs and other copyrighted Amiga OS files, will boot a Linux distro (AmiPUP, based on Slacko Puppy Linux) and launch AmiKit. AmiKit is a souped-up AmigaOS 3.x desktop with many third-party improvements already in place, and with the new edition using WinUAE (rather than E-UAE) it also offers the 'Rabbit Hole', which allows you to launch Windows and Linux applications (as well as Amiga ones) from within the Amiga-a-like desktop of AmiKit. You can buy the USB stick with AmiKit included for free (and possibly send a donation towards development) from bit.ly/AmiKitUSB.

SD Adaptor: AmigaKit is offering a SCSI-II to SD card adaptor, which allows an SD card to be mounted as a fixed storage device on machines with a SCSI interface (such as those in big box Amiga machines, edge expansion on the A1000 or A500 or trapdoor expansions on the A1200). Find out more at goo.gl/V46yVO.



Sven Harvey has been our Amiga specialist for over 16 years, drawing on his 25 years retailing computer and video games and even longer writing about them

Amiga



Ian McGurran is a professional IT analyst, a semi-professional writer and a pretty amateur electronic musician. He likes gadgetry and loves making gadgets do things they were never designed to do

Mobile

Box Clever

Ian McGurran looks at the latest mobile-based set top boxes

The last thing you expect to read about in a weekly column devoted to mobile-related news is about things that attach to your television. But it's also fair to say that what sits under your TV and what is in your hands is becoming ever more closely related and that they have a symbiotic relationship, with one needing the other to undertake some tasks, such as video streaming. Like all mobile gear, they're often refreshed, so let's take a look at two that 2015 has to offer.

Apple TV - from £129

It's been around for the longest out of all featured here, and even though it was one of the first in existence, and it's made in Cupertino, the Apple TV has never quite caught the public's imagination in the same way pretty much all other Apple main products have. To Apple's credit, however, it hasn't given up or quietly sidelined the little puck, instead always positioning it as Apple's representative in the living room.

While it has the innards and OS of the iPhone, it hasn't ever been quite as smart, with its

capabilities not really extending beyond playback of Apple media and the usual clutch of on-demand video service providers. Given the increase in competition, it had to change, and finally in 2015, the Apple TV has got smarter and finally has apps. For many, that's not such a big deal, but with access to the App Store, the platform moves from a TV and video box to an all-round entertainment system, including games. There's also the possibility of more third-party media players, such as Plex, giving the Apple TV appeal as a general media player that it hasn't easily had before. But there's a spanner in the works: the 2015 Apple TV starts at £129 for a 32GB version. That's more-or-less console prices and double the competition.

Amazon Fire TV - £79.99

Although Android set-top boxes had been around for ages prior to its release, Amazon's FireTV is arguably the catalyst for the Apple TV revision, being the first mainstream media box to offer a 'proper' app store, albeit the Amazon App Store. Powerful and keenly priced, it

wasn't a surprise that it sold well, especially when it and its budget brother, the Fire TV stick, were often reduced in price for Amazon Prime customers.

The Fire TV version 2 isn't a great change to the first, and it looks much the same. The main change revolves around a significant upgrade: 4K output. To put this in perspective, there are only a handful of 4K players, most of which are higher-end AV devices. That a 4K player has finally reached the pockets of the masses is definitely good for 4K, though for now you'll probably only get 4K material via Amazon's Prime Video service, as well as the usual Netflix 4K and YouTube 4K – a platform yet to fully flourish. Along with the bump in resolution comes, there's a bump in specs to cope: a 64-bit Mediatek MT8173 and faster wireless in the shape of 802.11ac. Like the Apple TV, the Fire TV is hobbled by its maker, but of the two, it's arguably more advanced and hackable than the Apple TV. In fact, the Fire TV 2 is arguably one of the best and most capable of all media players currently on the market, budget or not, given the device's 4K capabilities, unmatched by any consumer-level media players. Videophile hackers must be champing at the bit.

In review, it appears odd that given its leap to 5K on the desktop, Apple hasn't gone for the kill and gone to 4K on the Apple TV, though the lack of iTunes material may be the main reason for this. So for now, the Fire TV 2 represents not only the easiest way to go 4K, but also one of the cheapest. Don't write off the power of the App Store and games just yet, though...



Is It Okay To Love Microsoft Now?

Andrew Unsworth wonders if attitudes towards Microsoft have shifted

For many years, it's been unfashionable to say anything positive about Microsoft. We're supposed to hate on anything it produces, even though we adopt it immediately, which has always reminded me of the famous 'What have the romans ever done for us?' scene in *The Life of Brian*.

Those of us who grew up during the 8-bit era will have seen this tribalism many times before. We've had the ZX Spectrum versus the Commodore 64 (pity the fools who had an Amstrad CPC), the Atari ST versus the Amiga, and the SNES versus the Mega Drive to name but a few clashes of silicon-based civilisations.

The need to belong to an in-group and distance yourself from an out-group is an innate part of human nature, and although it might have had its uses when we couldn't even come down from the trees without something wanting to eat us, it seems pretty silly when applied to someone's choice of operating system. Each OS has its merits and its drawbacks, and the OS someone uses will be affected by natural inclination as much as need. I use Windows because of its ubiquity, and I'm happy with it, but I'd happily use Mac OS X if I could justify buying a MacBook Air, and I happily have used Mac OS X when editing copy for print. As for Unix and Linux, I've used those for the last 16 years for personal projects, for fun and to keep old PCs going. If there's one thing I've learned in

over 30 years of computing, it's that there's enough room for everybody and every OS.

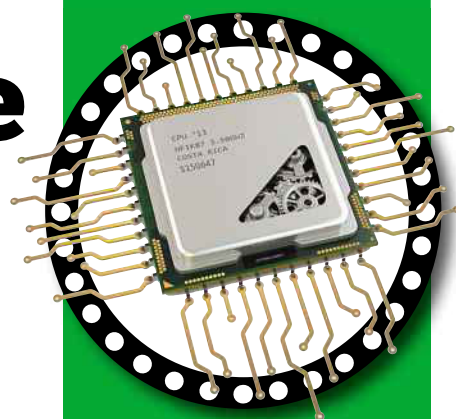
What got me thinking about this was the way Apple seems to occupy the most-hated spot once occupied by Microsoft, with Microsoft now regarded as the plucky underdog. I've seen people going potty over the new Surface Pro 4 and Surface Book, people who previously would only have considered buying Apple products. It's not hard to see why given the two Surface products' neat designs, use of sixth-gen Intel Core processors and a decent amount of RAM. For many people they really will bridge the gap between desktop and mobile computing, and it's great to see that Microsoft has stuck with and refined the Surface project.

If affection has swung from Apple to Microsoft, then maybe that's a good thing. Perhaps it'll spur Apple on to a new phase of innovation. However, it's best not to get involved in petty squabbles about something that ultimately doesn't matter. Use whatever you need, can afford or like,

and don't bother with what anyone else says.

Windows 10? I'll Wait

Now we come full circle with an example of using the OS most appropriate to your needs. I'm always suspicious of any free software offer, and when I heard that Microsoft was giving away Windows 10 for free, I knew there had to be something in it for Microsoft. My first thoughts were that early adopters would be guinea pigs in a giant beta testing program, and although I think I'm right, I think it's decent of Microsoft to give Windows 10 away for free to those who participate. I upgraded two of my computers to Windows 10 and gave it a completely open-minded go, before reverting back to Windows 7. My anti-virus package wouldn't work with Windows 10 and neither would some of my utilities, so I'll wait for a few months until I try it again. It'd be good to hear what you guys think about Windows 10 in the letters pages.



Andrew Unsworth has been writing about technology for several years, he's handy with a spanner, and his handshaking skills are second to none

Hardware



Ryan Lambie has loved videogames since he first stared up in awe at a *Galaxian* arcade cabinet in his local chip shop. 28 years on, Ryan writes about gaming for Micro Mart. He's still addicted to chips and still useless at *Galaxian*

Gaming

Life Is A Rollercoaster

Have you missed the theme park simulator series, *RollerCoaster Tycoon*? Then fear not, because Frontier's bringing it back in style with the great-looking *Planet Coaster*

This week, Ryan checks out Frontier's spiritual successor to *RollerCoaster Tycoon*, and looks at how the online shooter *Defiance* is faring...

Plug & Play

You could hardly accuse Frontier Developments of harbouring modest ambitions. Its galaxy-spanning space sim *Elite Dangerous* is set to increase in size and scope with its *Horizons* expansion, which will add player avatars and detailed, traversable planet surfaces, among other things. Meanwhile, Frontier's also planning to return to Earth with the forthcoming *Planet Coaster*, the studio's spiritual successor to its *RollerCoaster Tycoon* series.

Like *Elite Dangerous*, *Planet Coaster* is a modern reworking of existing ideas, with the earlier games' theme park management premise brought up to date with the kind of visuals and attention to detail that couldn't have been achieved a decade ago – which was roughly when *RollerCoaster Tycoon 3* came out. As before, the aim is to take a bare tract of land and transform it into a crowd-pleasing – and, above all, lucrative – tourist attraction, complete with rides, hotdog stands and other attractions. Like *RollerCoaster Tycoon*, you'll have control over just about every aspect of your park, from its design to the cost of tickets.

This time, however, Frontier's harnessing the power of its proprietary Cobra Engine (the

slab of tech underpinning *Elite Dangerous*) to simulate convincing-looking crowds, which not only flock and flow around your shiny new theme park, but also behave realistically as individuals.

"*Planet Coaster* is all about the individual," says John Laws, the game's director of art in a new diary video. "That little person is incredibly important. Every little guy has a little bit of money in their pocket, and what you're doing is creating a

very terrifying, twisted, exciting machine designed to get their money out of them."

Far from mere eye candy, *Planet Coaster*'s realistic crowd physics are designed to provide the kind of feedback we'd previously have picked up from dialogue boxes. If your park's poorly planned, you'll see people in the crowd begin to exhaustedly drag their feet. There might even be choke points where large groups of visitors wind up bashing into

Halo 5 On PC? Maybe...

At the time of writing, *Halo 5: Guardians* is on the cusp of release for Xbox One. If all goes to plan for Microsoft, it should prove to be one of the console's key releases, just as the original *Halo* was way back when the original Xbox came out. While it's a console exclusive for now, franchise director Frank O'Connor hasn't ruled out the possibility of a PC version of the shooter in the future.

"Microsoft has made a huge commitment to normalise the Windows experience across multiple platforms, so you're seeing elements of Windows 10 are going to appear on the Xbox and Cortana and stuff like that," O'Connor told *GamesRadar*. "There is plenty of chance that *Halo 5* could appear on the PC."

So, while O'Connor says there's "nothing new to announce" right now, it's just possible we'll see Master Chief's latest sci-fi adventure on PC in the next year or so...

➤ It's an Xbox One exclusive for now, but franchise director Frank O'Connor has suggested that a PC release of *Halo 5: Guardians* could happen. Eventually





▲ The game's up for Defiance: the TV series, but it's game on for its accompanying game, which will "continue exactly as before" its makers say

each other. On the other hand, if your rides are exciting and logically laid out, you'll see customers line up excitedly and cheerfully spend their money. That, of course, means more money in your coffers.

While *Planet Coaster* doesn't carry the *RollerCoaster Tycoon* name, it's clear that Frontier are putting just as much thought into reviving its spirit as it is with the ever-evolving *Elite Dangerous*. We'll see the results of its efforts some time during 2016.

Online

Launched in 2013, *Defiance* was conceived as an ambitious 'transmedia' collision of TV show and videogame. While the Syfy Channel handled the TV show

— a kind of sci-fi western about aliens and humans co-existing (and often falling out) in a future US — Trion Worlds handled the MMO. A third-person shooter set in a persistent world modelled on the one in the TV show, its events were intended to inform those in the series and vice versa, creating a cohesive merging of two very different kinds of entertainment.

Reviews of the game — which cost a reported \$70m to create — were cautiously positive, and *Defiance* has managed to weather the highs and lows of a gaming landscape not exactly short of online shooters. In fact, Trion Worlds has not only managed to oversee *Defiance*'s transition from subscription to a free-to-play model, but also seen

it outlive the companion series, which was cancelled on 19th October after three seasons. This, naturally, led to speculation that *Defiance: The Game* might be heading for the glue factory around the same time but, according to the company's CEO Scott Hartsman, it will "continue exactly as before."

"The show has always been a fantastic and interesting partner," Hartsman told *Polygon*, "but the two were always meant to be able to stand on their own, which is why the show was primarily set in St. Louis and the game in the SF Bay Area."

The game has certainly fared better than some might have expected; where the TV show's ratings clearly dipped to the point where continuing the series was no longer viable, the game's lead designer, Trick Dempsey, has indicated that its following was strong enough to survive without the TV show as a stablemate.

"We do really have a stunning following," Dempsey told *Polygon* last year. "*Defiance* has its own legs and runs on its own really well."

It does seem to have found its own niche among a dedicated community. So, while *Defiance*'s TV incarnation may be over, for Trion Worlds, show goes on.

Incoming

As you've probably already gathered, the *Star Wars* franchise will be just about inescapable this autumn. And so it is that, as *The Force Awakens* acts like a tractor beam in cinemas, you can more-or-less guarantee that *Battlefront* will be the game on everyone's lips this November. For once, Activision's *Call Of Duty* may have a fight on its hands. Even this close to release, EA DICE is still making fresh announcements; it's recently revealed that we'll be able to briefly play as Princess Leia, Han Solo and Emperor Palpatine as well as Luke Skywalker and Darth Vader — two Lucas-verse faces announced several months ago. Plus, we'll have the opportunity to fly around in the Millennium Falcon and Boba Fett's unspeakably cool ship, known as Slave 1. While some beta testers have argued that the pew-pew laser battles of the main game are perhaps a little too simplistic, it's the wealth of modes, ships and characters that will, we hope, give *Battlefront* the variety and depth it needs.

Star Wars: Battlefront is out on 19th November.



▲ You and your "pitiful band of friends" will be able to play the full version of *Star Wars: Battlefront* soon, and, if you're lucky, step into the villainous shoes of Emperor Palpatine

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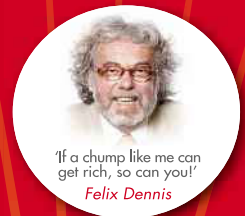
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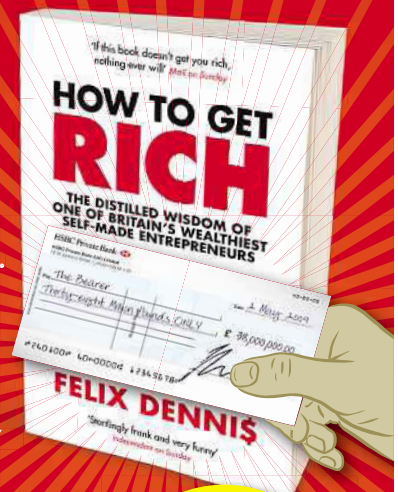
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ASK AARON



Meet Aaron Birch. He's here to help you with any general upgrading, software and system building problems. He's got advice aplenty and you're very much welcome to it!

Send your questions to:
Aaron Birch
Micro Mart
Dennis Publishing
30 Cleveland Street
London
W1T 4JD

Contact Aaron by email at:
aaron@micromart.co.uk

Please try to keep your queries brief and limit them to just one question per letter, simply so we can squeeze in as many as we can each week. Please include relevant technical information too.

Aaron

Broken Chrome

I spend a good deal of time online, and as such I rely on a good, dependable browser. Like so many others have, I decided to ditch Internet Explorer a long time ago as it's just plain bad. It's slow, buggy and pales in comparison to other browsers.

Instead, I decided to use Mozilla Firefox. I always liked Firefox and used it for a good long while. That is, until I had a problem with it that made the browser become unusable. Despite trying to fix it, I couldn't get it to work again, so went on the hunt for another browser (using IE to search). I eventually settled on Google's Chrome.

After installing Chrome, I was surprised to find another great browser, one that's very similar to Firefox, but in my opinion, is actually better. I used Chrome for a long time, only to eventually be hit with a similar problem to Firefox. Unlike Firefox, which wouldn't even run, Chrome does run, but fails to load up any pages. All I get is a white screen with black squares. If I click the settings button, the same happens, but after a long time, eventually the settings appears. When it does, however, it's non-responsive.

I've tried uninstalling Chrome, which made no difference and even tried using System Restore. This actually worked and Chrome seemed to work, but after a Windows update, it's failed again and has started to act up in the same way as before.

I'm really not sure what's happening here, and I've looked online for the problem. I've found similar issues, but none are the exact same problem, so any fixes I've found have been useless.

I really like Chrome and don't really want to move to another browser. Even if I did, I'm not sure if there are any other good browsers around. Please help.

Ken

I think the problem you have here could well be related to the Windows Update, although it's difficult to be sure. I have, however, encountered other problems like this. It seems that a specific Windows update may have caused some sort of problem with the visual aspect of Chrome, the part that renders the web pages and utilises the GPU. This problem, then, is causing the white and black screens you're getting.

There is a way around this, all you need to do is add an extra parameter onto the Chrome shortcut to disable the use of your PC's GPU. This should solve the problem and return Chrome to a working state.

First, right-click the Chrome shortcut on the Desktop (create a new one if you don't see

it) and select Properties. The command you need to add is '--disable-gpu' (note there are two dashes preceding the disable part). This command needs to be added at the end of the command in the Target box, with a space and outside of the parentheses. Once done, it should look like the following:

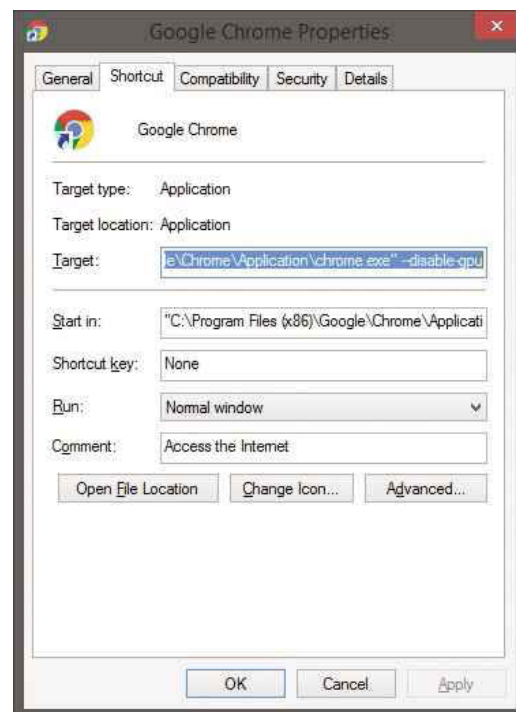
`C:\Program Files (x86)\Google\Chrome\Application\chrome.exe" --disable-gpu`

Once this command has been added, click Apply and close the properties box. Now, simply run Chrome from this shortcut and it should work correctly.

I understand your reluctance to move to another browser. IE, Firefox and Chrome are considered by many to be the major three decent apps, but there are other good browsers around worth checking out.

Opera (www.opera.com) is a good, secure browser with plenty of advanced features, and Apple's Safari (www.apple.com/au/safari) isn't just for Mac users and is a viable alternative for PC. There are also lesser-known alternatives that offer perfectly good features, such as Torch (www.torchbrowser.com), which comes with a built in Torrent client, media player and other functions and Maxthon (www.maxthon.com), which is a cloud-based browser that allows users to synchronise their devices. It's worth giving these a go if you're looking for another alternative.

▼ **A simple addition to Chrome's target command can fix GPU-related problems**



Slo-mo Refurb

I've recently bought a refurbished HP Elitebook 8460P and performed a few upgrades: 240GB Crucial SSD, 8GB DDR3 RAM and a fresh install of Windows 7 Professional, running on a Core i5 2540M, with HyperThreading.

It was supposed to be much faster than my old Dell Latitude D630 with a Core 2 Duo and 4GB DDR2 RAM, but it seems sluggish. Checking Task Manager shows the CPU running at 50-100% utilisation most of the time (RAM usage is about 2.5GB). I rarely run anything more than Firefox and Media Player, which typically account for about 30% CPU, all other processes are negligible, so I've no idea what in particular may be causing the high load.

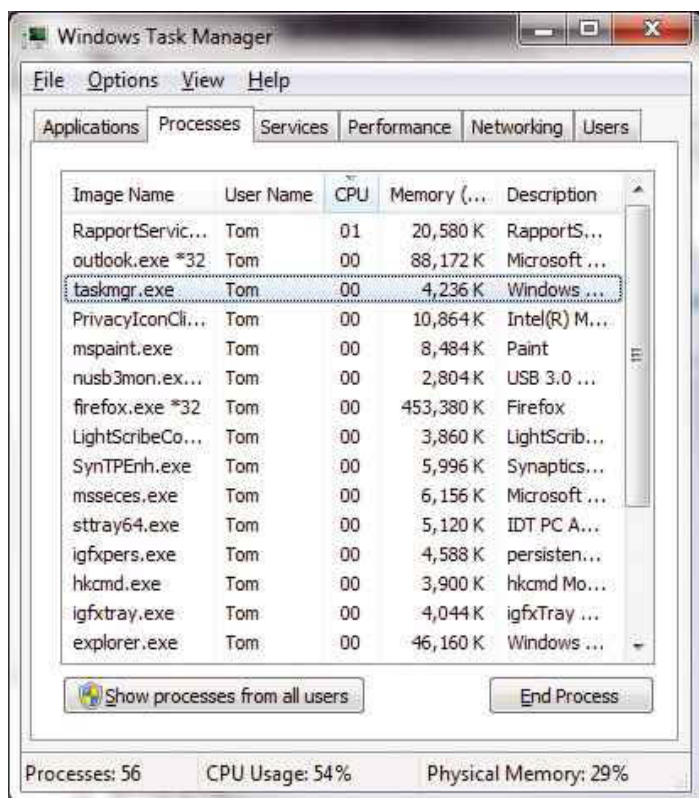
The windows sounds always run a few seconds behind too, which may or may not be relevant. I've installed all the drivers I can find from HP's website, although there is still one unknown device. The SSD is just about half full; and I'm pretty confident it can't be malware, even though I only use MS Security Essentials.

In short, I don't know what to do. I really don't want to re-install everything from scratch again. Any thoughts?

Tom

Looking at the screenshot you provided I can see no real obvious problems, although it only covers a small selection of running processes. Firefox is taking up a lot of memory, but that's not unusual. However, you do have the RapportService process running, which could be a problem.

This service, if legitimate, is an IBM package, and although it may be safe, it has been known to cause problems for some people, including affecting system speed and performance.



▲ Task Manager can reveal processes that are using too many resources, including possible unwanted guests

However, it's also possible that it could be malware, as there are known infections out there that masquerade as this IBM service. Besides that, even if it is legitimate, it's not an actually an essential process, and you can disable it, which I suggest you try in the first instance, as this could be contributing to your problem. As it could also be malware, I'd strongly suggest you download a good malware scanner like Malwarebytes (www.malwarebytes.org). Windows' built-in tools are passable, but far from great, so it's always better to install proper, third-party tools. That includes a good antivirus scanner. I'd suggest you consider this and replace Windows Security.

“ Ensure your SSD is using AHCI and not IDE in the system BIOS ”

As well as this, I'd suggest you trim down your startup routine, disabling any software you don't need. To do this, press Windows+R and type 'msconfig'. Under the Startup tab, browse through the list and disable anything you don't need. Nothing in this list is essential, so don't worry too much, unless it's security software like firewalls, antivirus and so on.

If you've not already done so, try running things like Disk Cleanup to remove junk files and perform the usual routine maintenance. Uninstall any programs you don't need and ensure your Windows Page File is set up properly and is situated on a different drive to your OS.

Another important tip I can offer you, is to recommend you ensure your SSD is using AHCI and not IDE in the system BIOS. Although it will work on the latter (and this can actually solve some problems with AHCI), SSD volumes usually work better under AHCI. This may require a reinstall of Windows, though, so you'll want to try other other suggestions first.



▲ AHCI is the desired interface for SSD volumes, in most cases leading to increased performance

ASK JASON



Meet Jason D'Allison, a veteran of Micro Mart's panel of experts. He's here to help with any technical questions, including anything to do with tablets or smartphones, as well as PCs

Send your questions to:
Jason D'Allison
Micro Mart
Dennis Publishing
30 Cleveland Street
London
W1T 4JD

Contact Jason by email at:
jason@micromart.co.uk

While we try to cover as many questions as we can, we regret that Jason cannot answer your questions personally, but he'll cover as many as he possibly can each week. Please ask one question per letter and remember to include the full specification of your computer, including its operating system.

Jason

In A Flap

This may seem a strange question for Micro Mart, but I'm looking for a simple means of sending a signal to a smartphone to record that an activity has taken place. As an example, this could be a switch attached to a cat-flap, and it would note each time the cat-flap opened (indicating that the cat had either come in or gone out). Any pointers? Maybe some sort of Bluetooth transmitter?

Barry Gower, Middlesex

This is beyond my narrow field of expertise, I'm afraid, but as it's such an interesting proposition I've decided to put it out there for input from other readers. I'm guessing Bluetooth isn't the way to go, as the phone would only receive the data when close to the switch and when paired with it. What would

happen when you're away from home or when the phone's paired to a Bluetooth speaker?

One of my mates does design and programming for smart energy meters and I know he uses a 3G radio to send a text message to a pre-assigned number twice daily. Wi-Fi could also be used to send out an email. I haven't looked, Barry, but I reckon this is a perfect application for a Raspberry Pi. Hook up a simple switch to the GPIO pins and configure some sort of scheduled task to transmit the data. Someone's probably already done it and maybe even written a custom Python script. The snag is that the Pi would need to be permanently plugged into the mains. What say you, dear readers?

▼ *I've heard that with a little creativity the Raspberry Pi can be used for more than a cheap means of watching films on a telly*



Animal Crackers

A while ago, on a whim, I bought an old MacBook (to replace my even older Windows laptop). The OS X version it arrived with was 10.5.3 (Leopard), and with a setup disc I've managed to get this up to 10.6 (Snow Leopard). I believe I should now be able to update to 10.6.8 (I don't think I can go any higher, as the CPU is a Core Duo). However, when I click Software Update on the Apple menu, the progress bar gets stuck and I receive an error stating there's a problem with my network connection. Well, there isn't. What's going on? How can I update?

John, Gmail

If you'd have asked me this a year ago, John, I'd have had to ignore you. I wouldn't have had a Scooby. But my business partner now forces me to use a MacBook for selling stuff on eBay, mostly because some years ago he bought a subscription

to Garage Sale, the Mac-only listing software, and apparently this never runs out. It pains me to admit that this software is actually quite good, and it also pleases me in a perverse sort of way to mention that it's also got more bugs than the beds in a £13-a-night Blackpool B&B.

Anyway, I've encountered this update issue myself. I don't think anything's amiss with your MacBook; I think the problem lies with Apple's servers. Your Core Duo is 32-bit, and as you suggest, the last version of OS X to support 32-bit CPUs is 10.6.8 v1.1. Which is ancient. For 10.7 (Lion) and beyond, a 64-bit CPU is required. Either 10.6.x isn't supported any more by the server's update engine or there's a bug that Apple can't be bothered to fix.

The answer is to update manually. Head to Apple's download portal: www.apple.com/uk/downloads. Under the Software Updates section, click 'OS X & Software'. On the next page, click Browse By Products and then use the search bar.

Lack Of Oxygen

Recommended in Micro Mart recently was the Archos 101 Oxygen, a 10.1" Android tablet. I can't find this on sale anywhere – it's absent without leave even on Amazon and eBay, and Google throws up nothing. Can you help? Also, do you know if it's been updated from KitKat (4.4.x)? Is it now running Lollipop (5.x) or even Marshmallow (6.x)? I wouldn't want to buy it if it's stuck in the past.

Also recommended not long ago was the second-generation Motorola Moto G smartphone. There was a suggestion to wait until 22nd October for the release of the third-generation model. Is this out now? How would I know which version I'm buying? I must admit to being confused by most of this stuff.

Joyce Dedic, Gmail

The Oxygen seems to have vanished from the shelves in the UK. Archos is a French outfit, and Amazon in France has a few left (www.amazon.fr), but I don't think UK delivery is permitted. Even on the French version of Archos's own website (goo.gl/bjEr8U), the Oxygen is listed as 'Indisponible' – unavailable. I can only assume it's been discontinued. A little odd, as I believe it only launched in May. In any case, if you wanted a sweet treat tastier than a KitKat, you're out of luck.

You need to direct your gaze elsewhere, Joyce. I think the RRP of the Oxygen was £169.99 – competitive for a tablet with a 10.1" 1080p display, a good dollop of bells and whistles, and enough chops for proper gaming. As an alternative, you'd have to look hard, I feel, to beat Google's own Nexus 9. This loses an inch on the screen diagonal but doesn't lose much in screen area (it's got a 4:3 aspect ratio instead of the Oxygen's 16:9). It betters the Oxygen in almost every way, and if you shop around it can be had for just a touch over £200.

Regarding the third-generation Moto G, yes, it's now out. Well, the version with 1GB of RAM and 8GB of storage has been out for some time, but as I mentioned in issue 1384, the

plum choice is the 2GB/16GB model. That's the one that's only just come to market. It's a good phone, but it's no bargain. At around £169, it's no better than the £129 Wileyfox Swift (www.wileyfox.com/swift). Indeed, the Swift has a gyroscope, compass, and notification LED, all inexplicably missing from the new Moto G.

Even better is Vodafone's astonishing Smart Ultra 6 (goo.gl/aqUfGA). It's a badge-engineered ZTE Blade S6 Lux. 5.5" IPS 1080p display, Qualcomm Snapdragon octa-core SoC, 2GB/16GB, microSD slot, 13MP shooter – it's beyond me how Vodafone can sell this for just £115. Don't worry that it's locked to Vodafone either – unlocking it costs just £2.29 on eBay. The Smart Ultra 6 is the budget phone to beat.

Note – As for identifying the new Moto G, it'll always be sold with 'third-generation' or '2015' in the description. If you don't see either of those terms, assume it's an older model. The first-generation model can be identified easily, as it has a 4.5" screen – the other two have 5" screens. Remember too, that the new model comes in two versions: 1GB/8GB and 2GB/16GB. Be careful.

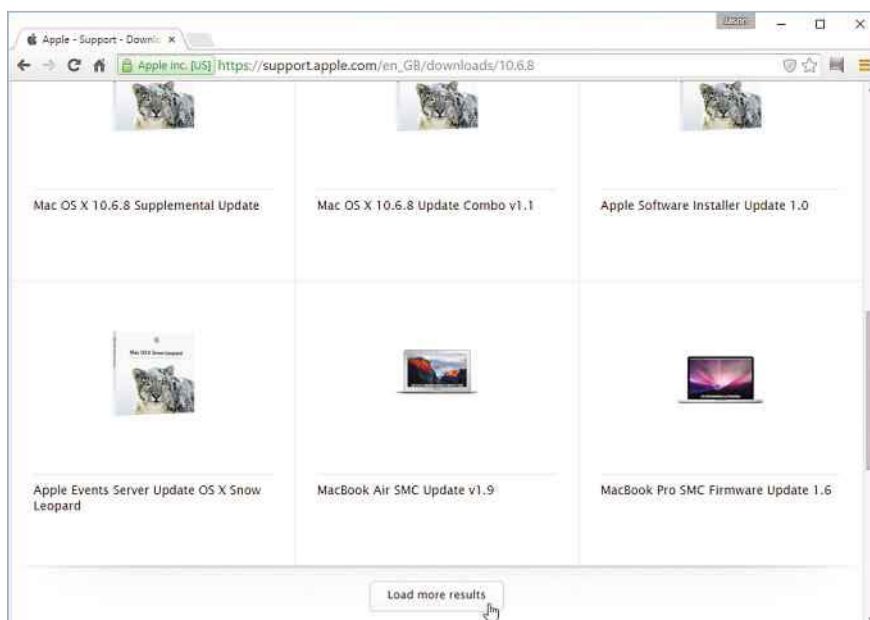
▼ The Archos 101 Oxygen: was it actually ever available in the UK?



Combo v1.1'. This rolls all 10.6.x updates into one and allows installation on any version of OS X from 10.6 to 10.6.7. The 'normal' 10.6.8 v1.1 update won't install from 10.6 – you'd first need to install some of the interim updates. Here's the direct link: goo.gl/inevwn.

Note – The download portal is infuriating. It's clunky at the best of times, but when you enter a search term, only nine results are shown. To reveal another nine results, it's necessary to scroll down and click 'Load more results' – repeatedly, like one of Pavlov's dogs. If you click a result to read more information but then decide it's not what you're after, hitting the browser's back button will return you to the first nine results and you'll have to start again! Is this one of the nine circles of hell?

► When someone serves up the old adage that Apple computers and software 'just work', I like to add in a good shake of sodium chloride



Crowdfunding Corner

This week, we're looking at two projects that allow you to broadcast your sound and video content across the very air itself. How futuristic is that?

SimpleCast

The power of smartphones means that, in many cases, your phone is a better entertainment device than your TV – except for the small issue of the screen being tiny. To solve that, you need a device that allows you to link up your TV and smartphone. And that's exactly what this is.

SimpleCast is a wireless mirroring device that will allow you to connect your iPhone, iPad, Android phones and laptop wirelessly to your home TV using nothing more than an HDMI input – like Chromecast, but with wider support and looser restrictions.

The SimpleCast promises to be easy to use and will enable you to browse the web, watch a movie, listen to music, play a game and more besides. The project was started in April 2015 and the electronics were completely finalised in August 2015, meaning it's ready to go into production as soon as the project is funded, with delivery expected by January 2016.

The most basic unit costs \$45 (£30) and paying higher amounts allows you to buy multiples for at a discount. The project's goal is a fairly modest \$10,000 (£6,500) so it seems like that it'll reach that by the closing date. Indeed, it's already almost halfway there after being live for less than a week!

URL: kck.st/1PSvALy

Funding Ends: Wednesday, December 2nd 2015



Mockingbird

Headphones are fine in many cases, but they aren't without their flaws. Not everyone wants to block off their ears while they're out and about, and if you want to share some audio communally there's not a lot you can do with the tinny, weak speakers included on most smartphones.

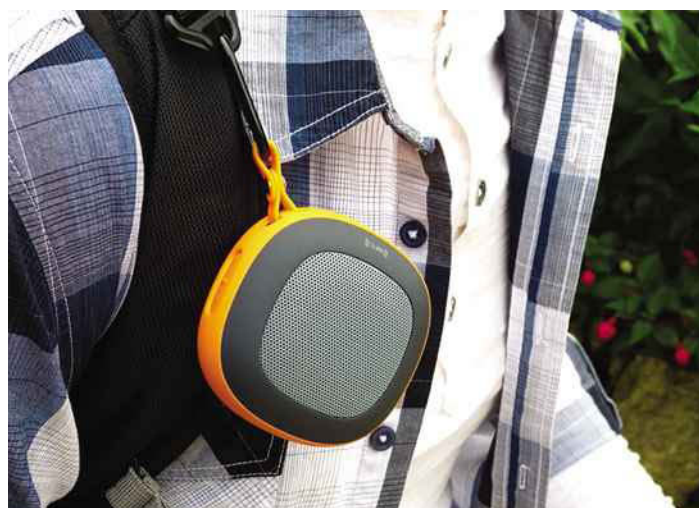
The Mockingbird is an ultra-rugged and waterproof wireless speaker, which its makers claim is capable of producing incredibly vibrant sounds for when you're out and about. Inspired, according to the producers, by "freedom and passion for music", Mockingbird uses the best sound technology available in a compact and powerful shell.

Its features are well-thought out too – you get an anti-slip backing, aux input, microUSB charge port and an LED battery indicator. It can even deliver voice alerts when it's pairing, running out of battery or deactivating itself, so you'll never be confused about what it's trying to do.

A single Mockingbird speaker costs £19, including audio cables and a carabiner so you can attach it to your clothes and/or backpack. A variety of discounts are available if you pay for multiple devices. The project is based in the UK and has already blown past its original goal of £1,000, with shipping due to take place in February 2016.

URL: kck.st/1XBg48h

Funding Ends: Thursday, November 23rd 2015



Disclaimer: Images shown may be prototypes and Micro Mart does not formally endorse or guarantee any of the projects listed. Back them at your own risk!

App Of The Week

Bitdefender Mobile Security and Antivirus

We look at some mobile protection this week

There are now several billion active Android devices around the world. Most are either smartphones or tablets, with a smaller percentage being things like Android TV devices or some other console-esque items of technology. In terms of OS coverage, Android accounts for 82.8% of the global market, which is pretty significant.

Therefore, a number this large isn't going to be overlooked by those who relish in exploiting the security vulnerabilities that will inevitably be present, no matter how updated the system appears to be. Gone are the days when viruses, digital theft and privacy were exclusive only to the PC; these days, the mobile criminal is well and truly active.

Most of the time, an Android device, used for just calls or texts, is relatively secure. But once you start installing all manner of apps, games and so on, the security levels drop significantly. A recent study has shown that of over 800,000 free Android apps analysed, 35% can access a user's location, while almost 3% can leak e-mail addresses, 5% can locate and open photos on users' phones and 10% can read contact lists. Scary stuff indeed.

Bitdefender To The Rescue

The security experts at Bitdefender have been busy updating the company's first line of defence for mobile users: Bitdefender Mobile Security and Antivirus.

Within the app, you'll get four main areas of protection: a Malware Scanner, a Privacy Advisor, Web Security and an Anti-Theft element. And there's an extra element that connects to a smartwatch.

The Malware Scanner has been independently tested to detect, as Bitdefender put it, "100% of the bad stuff". It automatically scans the apps as you install them to locate anything untoward, and issues a warning should something come up that's in line with the latest signatures as released through the Bitdefender cloud. This means it's constantly up to date and works in the background to keep you protected.

The Privacy Advisor works by monitoring the activity and behaviour of the installed apps on your device. Should one of them suddenly decide to leak your contacts list to an unknown location, the advisor kicks into action and displays the errant app.

Features At A Glance

- **Malware scanner:** independently tested to detect 100% of bad stuff.
- **Privacy advisor:** shows you how installed apps use and possibly abuse, your personal information.
- **Web security:** protects you in real time when browsing websites using Chrome and Android's default browsers.
- **Anti-theft:** features its own web dashboard that allows you to send SMS commands, lock, track and wipe your Android from any internet-connected device.

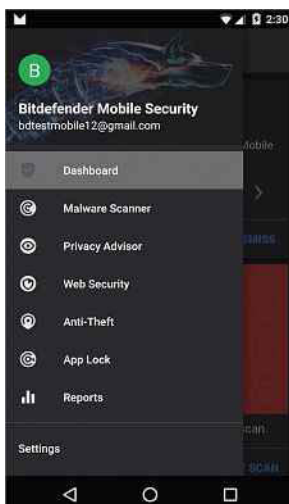
Web Security works in much the same way as a traditional online protection tool works on your PC. As you browse the internet on your Android device, it actively monitors the site you're accessing and keeps away the nasties, as well as helping you to avoid those sites that are designed to foul up your phone.

The anti-theft function is very a cool feature. It uses a web-based dashboard that will allow you to send SMS commands, lock, geo-locate, sound an alarm and wipe your Android from any internet-connected device, should you ever misplace it or have it taken from you. It also allows you to listen in on your phone, alerts you if the SIM card has been changed and allows you to password protect your settings. It's quite a well-featured part of the protection suite and is an impressive selling point in itself, regardless of the other advantages this app offers.

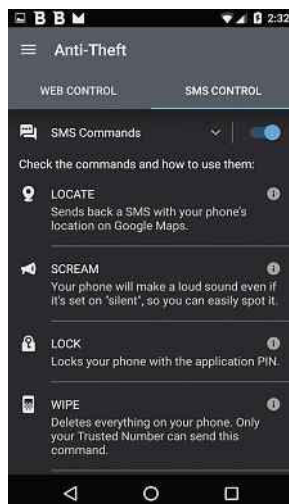
Conclusion

Unfortunately, we need to take mobile security seriously, which is a sorry state of affairs really, so what better then to install an all-encompassing security suite from the people who create protection suites for a living?

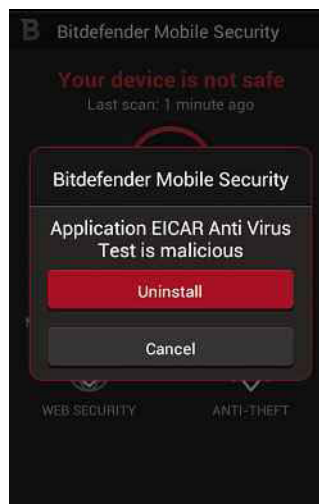
Visit the [Google Play store](#) for more information. [mm](#)



▲ A safe mobile makes for a happy user



▲ The anti-theft feature is excellent



▲ Bitdefender monitors your apps, connection and everything else

Logging Off

A year ago, Tesco launched its second-generation Android tablet, the Hudl2, and it was generally well received. It sold a good many of them to those who wanted an inexpensive but reasonable quality device but didn't want a hobbled offering from Amazon.

According to some figures, it sold at least 750,000 of the original Hudl, and quite a few of the Hudl2, despite it having a

well-documented charging fault that was a firmware-based problem it seemed unable to address.

However, this October didn't see the appearance of the Hudl3; instead the company issued the following statement: "We have sold out of Hudl2 tablets and will no longer be selling it in our stores or online. We would like to assure customers that we will continue to provide technical support and help to all of our customers who have purchased a Hudl."

Or alternatively put in the epic words of Douglas Adams: "So long, and thanks for all the fish."

What's kind of curious is that just a week before it made that statement, it made another where it described the Hudl2 as "a popular device with our customers". Obviously, still not popular enough to actually be made, sold or supported any longer, it now appears.

Of course, this future was always a strong possibility since Tesco kyboshed most of its streaming services and portals for which the Hudl line was essentially a subsidised shopfront. Not having those services and failing to work with another provider (like Amazon) to take a cut of someone else's, there was relatively little point in Tesco selling its own brand of tablets.

So where does that leave Hudl and Hudl2 owners? Exactly where most people's devices end up when the company behind them moves on so smartly: nowhere.

I can say that with some certainty, because the majority of the team that designed the Hudl range have already left the employment of that company, taking their brains with them.

As they did that, the original Hudl will probably remain on Android Jelly Bean forever more, and the Hudl2 will never progress beyond Lollipop, despite having 2GB of RAM.

For those technically minded enough to do these things, it's possible to root both devices and then use a ROM cooked up by an interested party, but exactly how good that will be isn't guaranteed.

EDITORIAL

Editor: Anthony Enticknap
theeditor@micromart.co.uk

Designer: Laura Jane Gunnion
Designer: Kevin Kamal

Bonus John: John Moore

Contributors: Mark Pickavance, Jason D'Allison, Joe Lavery, Sven Harvey, Simon Brew, Dave Edwards, Ryan Lambie, James Hunt, Mark Oakley, Roland Waddilove, Eggs On Toast, Sarah Dobbs, David Hayward, Michael Fereday, Ian McGurran, Aaron Birch, David Briddock, Craig Grannell, Kevin Pocock, Andrew Unsworth, Dave Robinson, Keir Thomas, Rob Leane, Chris Hallam

Caricatures: Cheryl Lillie

ADVERTISING

Group Ad Manager:
Andrea Mason
andrea_mason@dennis.co.uk

Sales Executive:

Joe Teal
Tel: 0207 907 6689
joe_teal@dennis.co.uk

US Advertising Manager

Matthew Sullivan-Pond
matthew_sullivan@dennis.co.uk

MARKETING

Marketing Manager:

Paul Goodhead
Tel: 0207 907 6393

PRODUCTION

Production Coordinator:

John Moore
Tel: 0207 438 2074
MicroMartAdCopy@gmail.com

Digital Production Manager:

Nicky Baker

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NEWSTRADE SALES

Newstrade Director:
David Barker

DENNIS PUBLISHING

Group Publisher:
Paul Rayner
paul_rayner@dennis.co.uk

Managing Director:

John Garewal

Group Managing Director:

Ian Westwood

COO: Brett Reynolds

CEO: James Tye

Company Founder: Felix Dennis

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The pile of disavowed tablets at this point is becoming mountainous, and Tesco has just contributed significantly to it.

At the time of writing, you can still buy the Hudl2 8" wi-fi tablet on Tesco Direct for £99, and you're encouraged to 'Hurry while stocks last'. But because this is exactly the same price as it was before Tesco decided to kill this venture, why would anyone in their right mind want one at this not-a-bargain price?

Having killed off its Hudl phone before it even arrived, all its digital offerings and now their tablet, Tesco has gone off to focus on selling groceries, which according to its sales latest figures it's not much good at doing either.

If there's a lesson to be learned here, it's one that Lidl and Aldi could well learn. When some cocky young exec suggests that a branded phone and tablet might be a great plan and popular with customers, a swift knuckle sandwich is always the correct response.

Mark Pickavance

LAST WEEK'S CROSSWORD

Across: 7 Specification, 8 Idling, 9 Locate, 10 Regedit, 12 Mylar, 14 Parse, 16 Website, 19 Report, 20 Israel, 22 Hang Seng Index.

Down: 1 iPod, 2 Scribe, 3 Off-Grid, 4 Scale, 5 Sticky, 6 Contrast, 11 Evade Tax, 13 Besiege, 15 Stooze, 17 String, 18 Steel, 21 Even.

DISCLAIMER

The views expressed by contributors are not necessarily those of the publishers. Every care is taken to ensure that the contents of the magazine are accurate but the publishers cannot accept responsibility for errors. While reasonable care is taken when accepting advertisements, the publishers cannot accept any responsibility for any resulting unsatisfactory transactions. As we write this, it's a Friday morning – the day before Halloween. Yes, it's that time of year when strangers knock on your door and demand sweets from you, on threat of vandalism. Your reply, of course, should be "Go away. I'm not American and neither are you." But you'll probably more likely head off to your kitchen to see if

you can find any of the 'candy' they've requested, returning to them with what's left of your multi-pack of KitKats and perhaps a few loose Murray Mints. Personally, we think getting our kids to knock on our neighbours' doors and ask for food is just plain rude, but that doesn't mean we don't like Halloween at all. In fact, this year, Tony even carved a jack o'lantern for the first time (it was also the first time he'd ever seen the inside of a pumpkin). It ended up looking like it was smiling joyfully, instead of being scary, but it was fun nevertheless. What will his response be to treat-or-treaters, though. Well, it would probably be 'humbag', but they'd no doubt think he was going to give them some mints (which he's not).

THIS WEEK'S CROSSWORD

Across

7 He established the differential equation governing heat diffusion and solved it by devising an infinite series of sines and cosines capable of approximating a wide variety of functions. (6,7)

8 Go beyond what is allowed or stipulated by a set limit. (6)

9 Alter so as to make something more user-friendly or efficient. (6)

10 Swedish astronomer who devised the centigrade thermometer. (7)

12 A small device, especially an electrode, used for measuring, testing or obtaining information. (5)

14 Canine-friendly FTP client for Mac OS X. (5)

16 The trait of acting unpredictably and more from caprice than from reason or judgment. (7)

19 Play a media file as it downloads from the internet. (6)

20 Have or develop complicating consequences. (6)

22 A senior barrister appointed on the recommendation of the Lord Chancellor. (6,7)

Down

1 A humorous or malicious deception. (4)

2 Pre-determined measures of achievement in a computer game. (6)

3 The chemical element of atomic number 45. (7)

4 A secret store of valuables or money. (5)

5 A PC program that controls the operation of a device such as a printer or scanner. (6)

6 The 'Software' house that originally brought you *Mega Lo Mania*, *Cannon Fodder* and arguably the best world soccer game around at the time. (8)

11 A natural or artificial alloy of gold with at least 20% of silver. (8)

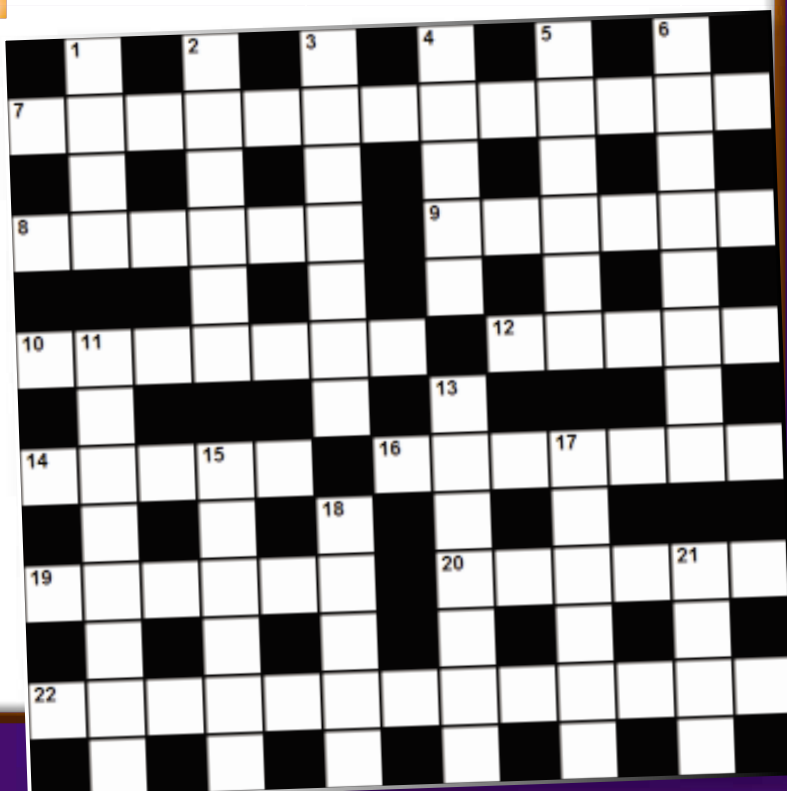
13 A vacuum flask that preserves the temperature of hot or cold drinks. (Trademark) (7)

15 Showing inventiveness and skill. (6)

17 A turning force produced by an object acting at a distance. (6)

18 The programming language used in the online 'Adventure Games Live.' (5)

21 A technique used to reduce engine wear in large airliners by performing take-off at less than full power. (4)



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